

NOTICE BY THE PUBLISHING COMMITTEE.

The American Journal of Pharmacy has now reached its 27th volume. On an examination of the stock of the Journal, the Committee find that three of the volumes are wholly or partially out of print—viz. vols. 1 and 2 of the first series, and vol. 1 of the second series. All the remaining volumes, twenty-one in number, they can supply on demand. Believing that the work embodies a large amount of information, extremely valuable to Apothecaries, Druggists and Physicians—comprehending, in fact, a faithful record of the development of Pharmaceutical science and invention during the period of its issue, now twenty-five years, both in Europe and America, the Committee consider that no Pharmaceutical library should be without it.

Besides the abstract and applied science embodied in this work, a large number of formulae are contained in it, including many, which, though not official, are more or less valuable and in use.

As an inducement to Subscribers to complete their sets as far as possible, the Committee offer the last volumes to the 24th inclusive, at the reduced price of \$1.50 each, post.

The volumes 25 to 27 inclusive, are held at the publishing price, \$2.00, unless a full set is taken, in which case they will be supplied at \$2.50 per volume.

The Committee offer the publication price in money for the 6th number of the 1st volume, published January, 1830; for the complete 3d volume, commencing April 1830; and the complete 7th volume, commencing April, 1834.

CHARLES ELLIS,
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EDWARD PARSONS, } Committee.

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SPIRITUS ÆTHERIS NITRICI.

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The U. S. Pharmacopœia formula for this preparation is as follows :—

“ Take of Nitrate of Potassa, in coarse powder,	two pounds,
Sulphuric acid,	a pound and a half,
Alcohol,	nine pints and a half,
Diluted alcohol,	a pint,
Carbonate of potassa,	an ounce.

Mix the nitrate of potassa and alcohol in a large glass retort, and having gradually poured in the acid, digest with a gentle heat for two hours ; then raise the heat and distil a gallon. To the distilled liquor add the diluted alcohol and carbonate of potassa, and again distil a gallon.”

The apparatus necessary to conduct this process properly is as follows : A tubulated retort of a capacity of two gallons. Into the tubulure, through a perforated cork, a tube thermometer should pass, so that the bulb may be near the bottom of the retort. A Liebig's condenser of good size, and a receiving bottle marked at one gallon by slips of paper. The mouth of the bottle should be tied over with a piece of sheet caoutchouc that has been perforated to receive the eduction tube of the condenser. The connections should be made with moistened muslin, covered with sheet caoutchouc.

The mixture is made in the retort in the order of alcohol, potassa salt, and acid, and the whole shaken round. The apparatus is then set up in a steam or water bath, and the materials digested at 100° for two hours, and then heated to active distillation. The greenish yellow mixture commences to boil at 125°, and at 180° full active ebullition and distillation is estab-

lished. From this point the temperature gradually, and toward the last, very slowly rises to 184° , when $5\frac{1}{2}$ or 6 pints of colorless distillate will have passed over. This distillate is free from any perceptible odor of hyponitrous ether, but has throughout a distinct odor of sulphuretted hydrogen. The salt in the retort forms a cake at the bottom, and the liquid boils around and over it without any apparent effect upon it. The distillation then slackens somewhat, but no perceptible reaction will have taken place till 6 pints of colorless and odorless (except for sulphuretted hydrogen) distillate has passed over. An hour or more is thus occupied before the period of reaction arrives. The cake then commences to dissolve and break up, the solution becomes gradually of a deeper yellow tinge, faint yellow vapors appear in the retort, the temperature rises slowly to 185° or 186° , the distillation increases, and the distillate becomes perceptibly yellow. Coincidentally with these changes, and indicating distinctly the full establishment of etherification, the temperature in the retort commences to fall. When it has fallen one or two degrees the heat should be shut off and the reaction be allowed to go on spontaneously, or with only a very slight heat at most. As the temperature falls, the distillation slackens, till at 170° it only comes over by a fast dropping. If the prescribed quantity has not passed over, the heating should then be cautiously resumed, and the remainder driven over at a temperature not exceeding 180° .

If, on the contrary, the active heating should have been too long continued, and the reaction becomes too active, so that much gas and uncondensed ether vapor passes over, the heat must be entirely withdrawn and the retort cooled with water, copiously applied. This requires rapid and dexterous manipulation to avoid an undue proportion of aldehyd in the distillate; for, although aldehyd comes over at all stages of the process, it comes much more rapidly as the temperature and activity of the reactions increase. It is then, probably, that it is formed too rapidly to be all of it fixed by the secondary reactions, and thus passes over with the distillate.

It is sometimes difficult to get a gallon of distillate below 180° , in which case the thermometer may be made to rise to 182° or 184° . A temperature of 186° , however, can never be exceeded

with safety to the product, and as very little ether is formed at the close of the process, it is better to arrest it an ounce or two short of the prescribed volume, than to risk a higher temperature. If carefully managed, it is easy to control or arrest the process at any stage, by diminishing or stopping off the heat; but if incautiously managed, a new and comparatively uncontrollable reaction occurs, which produces no ether, but aldehyd and hydrocyanic acid vapors in abundance. The operator should therefore be always in readiness to remove the receiving bottle, particularly if using larger quantities of materials than those of the officinal formula. At the end of the process the retort contains 36 f.℥ of residue, in two layers. The upper one, of say 4 to 6 f.℥, is yellow, transparent and oleaginous; the lower is white or opaque from mechanical admixture of an undissolved salt. This residue should be poured at once from the retort, in order to avoid risk of losing the vessel in the attempt to get it out after it solidifies. This residue boils actively long after being poured into a cool vessel, and the vapors given off by it are hurtful.

The retort, condenser, and all the muslin, &c., used about the connections having been thoroughly washed, and the apparatus again set up, the rectification is commenced.

The carbonate of potassa having been put into the receiving bottle at the commencement of the process, and the distillate having been received upon it, the whole is now well shaken up with the palm of the hand, only, over the bottle mouth, and poured into the cleansed retort, and the bottle rinsed in with the diluted alcohol. The bottle is then rinsed clean, tied over as before, and replaced in the apparatus, when the heating is cautiously resumed. At 130° to 133° the liquid will fairly boil, and must be kept from boiling too rapidly for the capacity of the condenser, as it is easy to drive off an important portion of the ether by too rapid heating at first. One fourth of the gallon should pass over before the temperature rises above 176°, and as this portion contains nearly all the ether, the remainder being more easily condensed may be distilled more rapidly.

If the first fourth of this distillate be kept apart and distilled fractionally, it commences to boil at 68 to 72°, boils rapidly and distils fast at 74°, and then steadily and more and more slowly arises to 156°. The receiver is then changed and 8 f.℥ more

distilled over. This is redistilled to 17 f.℥. The first product measures 8 f.℥ received up to 156° , is of a golden yellow color, and has a s. g. of .8914 at 50° . The second product 17 f.℥ is of a paler yellow and has a density of .862 at 50° . The rejected portions still contain some ether, probably 3 f.℥ of the same density as the last product. By a calculation based upon the specific gravities, this would give to the official spirit of nitre by this process, a composition of 123 f.℥ alcohol, and 5 f.℥ of pure dry hyponitrous ether, or about 4 per cent. of the ether under the most favorable circumstances.

The sweet spirit of nitre obtained by this process is a volatile, transparent, bright liquid, of a greenish yellow tint—never colorless, and of a fragrant but not pungent odor. It boils at 156° to 158° and has a specific gravity of .840 to .841 at 60° when freshly made. It is perfectly neutral to test paper, and gives a deep straw color with dilute solution of potassa within half an hour.

With good materials and careful manipulation this process yields an excellent medicinal preparation liable only to the objections that it contains too much aldehyd, and is not as uniform in strength, nor quite as strong as desirable. When put up at once in half pint bottles, well filled and well stopped with waxed glass stoppers, and the bottles covered with dark paper, it keeps well. Several bottles of it made in March, 1854, were examined recently in connection with this part of the subject, and were found to have undergone no perceptible change. It is the practice of this laboratory to make this preparation fresh for every vessel of large class that is fitted out in the navy, and the preparation now examined was made for the frigate *Columbia*, then fitted out as the flag ship of the home squadron, and was returned with the stores of that vessel when she was laid up, after a cruise of nearly two years, principally in the West Indies. As a test of the keeping properties of the preparation when well made, I regard this as conclusive. Another specimen one year and three months old, is in the same good condition.

After having practiced this process bi-monthly or oftener for two years, it was abandoned in search of a better and more convenient one, for the following reasons:—

It is unnecessarily circuitous and complex.

It makes use of a salt that is often difficult to obtain free from chlorides; and that is nearly insoluble in the menstruum used, thus postponing the reactions and rendering them somewhat variable and precarious. The reaction which produces an undue proportion of aldehyd in the distillate, and which probably occurs at temperatures about 186° to 190° may very well take place in that portion of the materials confined under the cake in contact with the bottom of the retort, for it is not uncommon to see a violent boiling out from under the cake, when the ebullition elsewhere is quietly and steadily going on. There is no way of securing uniformity of temperature and reaction in a retort of boiling liquid when a cake of solid matter lies upon the bottom.

The process distils over from one half to three fourths of the alcohol twice unnecessarily, for the six pints first received in the etherification, and last received in the rectification, are simply alcohol. This unnecessary distillation occupies half the time of the process, and requires a larger apparatus than is commonly possessed by apothecaries.

In making nitric acid, the materials used in this process should yield practically about $18\frac{1}{2}$ $\bar{3}$ of an acid of 1.41 s. g., and upon this the following process is based; and this process is the best substitute for the official one that I have yet tried, and its details and results are based upon an experience of nearly a year and a half:—

Take of Nitric Acid,	s. g. 1.408	28 f. $\bar{3}$ = 37 $\bar{3}$ = 2lb 8 $\frac{1}{2}$ oz. Av.
Alcohol,	" .835	20 pints.
Carbonate of potassa,		2 $\bar{3}$.

The apparatus required is the same precisely as that for the U. S. P. process, except that, for double the yield, both the retort and receiver may be of 2 pints less capacity. The receiver should be marked at each pint by a pencil on a slip of paper pasted vertically on the side of the bottle.

One gallon of the alcohol is introduced into the retort, the acid slowly added to it, and heat applied through the intervention of water, or preferably by a steam jet. At 178° the yellow mixture begins to boil; and faint yellow vapors appear in the retort as brisk distillation commences at 184° , the distillate being slightly yellow and ethereal from the beginning.

As the distillation proceeds, the boiling mixture and the atmosphere within the retort become more yellow till the temperature reaches 188° , and three pints have passed over. The temperature then, if watched closely, will be seen to fall from $\frac{1}{2}^{\circ}$ to 2° , according to the amount of heat applied at the time, and coincidently with this, a material increase in the rate of distillation and color of the distillate occurs. This indicates the full establishment of the etherifying reactions, and should be carefully observed and appreciated. As soon as the distillation increases and the temperature begins to fall, the heat should be moderated down, and as soon as the reaction is fully established, the heat should be entirely withdrawn. The thermometer then falls very slowly and steadily to 170° , the distillation also decreasing till at 170° about $5\frac{1}{4}$ pints of distillate have passed over. The heating is then cautiously resumed, and the thermometer kept steadily at or about 176° till $6\frac{1}{2}$ pints have passed over, when the process is terminated and the apparatus taken down, thoroughly rinsed out, and set up again.

The carbonate of potassa is added to the distillate and well shaken with it, the bottle being closed only with the hand. The mixture is then poured into the retort, and the rectification commenced, slowly at first, or at least with a speed proportionate to the capacity of the condenser. The mixture boils at about 80° , distills rapidly at 100° , and 18 f. $\bar{3}$ should pass over before the temperature rises above 150° . The heat may then be increased from time to time, and the remainder pushed over rapidly till $5\frac{1}{2}$ pints have been received. The distillate is then transferred to a larger vessel, alcohol added to it till it measures 17 pints, the whole well shaken, and then put up in half pint bottles, well filled, and well stopped with waxed glass stoppers, and the bottles covered with dark blue paper. The whole process occupies about 4 hours.

The product is neutral, of a clear bright yellow tint, and fragrant odor free from pungency. The s. g. is .841 to .842, it boils at 156° to 157° , and gives but a pale straw color with dilute solution of potassa within half an hour. It is occasionally so free from aldehyd that several hours is required to develop the color with solution of potassa. The tint is generally seen within an hour by looking through the test tube in the direction of its

long axis. The comparative freedom from aldehyd, for it is never altogether free from it, is an indication of the care and success with which the process has been conducted, and is, too, an indication of the length of time the preparation will keep in dispensing. Put up as above directed, this preparation has kept for one year without the slightest appreciable change. How much longer it will keep, I am not able to say at present.

If, in the rectification of the above product, the distillation be conducted fractionally and the different portions of the distillate examined, they will be found nearly as follows:—

18 f.℥	received up to 150°	golden yellow,	s. g. .900 at 50°
2½ f.℥	“ “	160° pale straw,	“ .878 “ 57°
6½ f.℥	“ at 160°	paler “	“ .869 “ 56°
10 f.℥	“ up to 176°	“ “	not examined.

The last portion, not examined, probably contains 1½ f.℥ of ether, of s. g. .869, at least, in which case a calculation by the specific gravities indicates that this preparation contains very nearly 14 f.℥ of dry hyponitrous ether, s. g. .947, or about 5.1 per cent.

In adopting the proportions of this formula I supposed it would yield a preparation medicinally identical with that of the U. S. P. process, and this supposition, based upon a practical observation in making nitric acid, was strengthened by the physical properties of the resulting spirit of nitre. I have since found, however, as now stated, that the 18½ f.℥ of nitric acid of s. g. 1.408 that the United States Pharmacopœia materials do yield when distilled separately is not utilized in that process, for if the ready made acid in this quantity is substituted for the materials for generating it, the yield of ether is over 1 per cent. more in the preparation. The U. S. P. process should yield a preparation containing 5 per cent. of dry ether, but cannot be made to do so in my hands except by obtaining the nitric acid as a separate operation. Why the acid yields one fourth more ether than I can obtain in using the materials for generating it, I could only attempt to explain upon theoretical grounds, which I do not fully entertain in opposition to the practical experience upon which the Pharmacopœia process is based.

This process of obtaining a dilute hyponitrous ether, and then farther diluting it, is quite applicable to general pharma-

ceutical use, and from the experiments I have made for reducing the scale with this view, I venture to assert that any apothecary who can compound a prescription properly can as easily make this preparation for himself. It is one of those preparations, and the number of such is not few, that is more easily made upon the small scale, simply because the success that attends the process depends mainly upon a temperature, and because this is more easily regulated in small vessels with small quantities of materials to react. It can be made very cheaply too, and with an apparatus so simple, and of so general an adaptability, that a great majority of apothecaries doubtless always possess it.

Having recently bought such an apparatus for making these experiments on the small scale it may be worth while to enumerate it, and mention the cost.

A tubulated retort 14 to 16 f.3 capacity,	cost	\$0 42
A tubular thermometer,*	"	1 75
A piece of thin glass tube, $\frac{1}{4}$ inch internal diameter and three feet long; and two short pieces of small glass tube which may be bent in the lamp,	cost	0 13
And two feet of small india rubber tubing,	"	0 25
		<hr/> \$2 55

Of these last materials I made a very good Liebig's condenser with corks, by soldering together two plaster cans for a case. The necessary lamp and stand, vessel for a water bath, and proper supports, are always at hand in some form that may be made available. With such appliances the dispensing apothecary can, and should make this preparation for a length of time proportionate to the care and skill with which he uses them, with great advantage to himself, to the patient and to the physician.

* These thermometers are imported from Germany. They are by far the most convenient and useful. They consist of an opaque glass scale and capillary tube with black figures, enclosed in a glass tube not much larger than that of a barometer. Being entirely of glass, except the enclosed mercury, they are well adapted to an extended and indiscriminate use.

They may be had of J. F. Luhme & Co., No. 565 Broadway, or of F. Liese, No. 102 John Street, New York, of Mr. A. P. Sharp of Baltimore, and probably also of apparatus dealers generally.

Take of Nitric Acid, s. g.	1.408	2f. 3.
(or " " " "	1.35	2½ f. 3.)
Alcohol, " "	.835	22½ f. 3.)
(or " " " "	.838	21 f. 3.)
Carbonate of Potassa,		25.

The apparatus being set up, add the nitric acid slowly to 9 f. 3 of the alcohol in the retort, and having the thermometer in place, apply the heat. The mixing of the materials gives them a temperature of 93° to commence with. If the nitric acid used is nearly colorless the mixture will be colorless also till heated to near the boiling point, when it becomes yellow.

It begins to boil at 179° to 181° and boils and distils actively at 184°, yielding a yellow distillate from the first. It occasionally happens that this in common with many other liquids, boils badly, becoming heated far above the boiling point, and only boiling at intervals and by bursts of ebullition. This curious condition of fluids commonly occurs in small round bottomed glass vessels, and may be measurably controlled by having a fragment or two of glass in the retort. These should not be dropped in while the liquid is heated above its boiling point, as they then almost invariably cause it to boil over, but the process should always commence with this simple precaution.

The mixture goes on boiling and distilling steadily at a temperature gradually and slowly rising to 186° or 187° where it becomes stationary till 7 f. 3 of distillate has passed over. The heat is then moderated by lowering the lamp till the temperature falls to 176°, and the distillation continued about this point till the distillate amounts to 8 f. 3. when the first part of the process is terminated.

During this distillation the temperature is liable to fall suddenly a degree or more, and then slowly rise again, such variations of temperature may be disregarded as long as the rate of distillation continues unchanged; but if coincidently with a fall of temperature the distillation should increase and gases pass over uncondensed, the lamp should be at once removed. The temperature will then continue to fall steadily to 170° while the distillation slackens, when the heating may be cautiously resumed till the prescribed 8 f. 3 has been received below 176°

The apparatus is then thoroughly rinsed out, the distillate re-

turned to the retort, the carbonate of potassa added to it, the whole shaken round well without splashing into the retort neck, the apparatus connected, and the warm water of the bath carefully and slowly applied so that the distillation does not exceed the capacity of the condenser. This capacity is easily and nicely determined by watching the drop which always occupies the end of the small eduction tube fitted to the end of the condenser. If the condenser is working below its capacity, bubbles of air will from time to time pass *into* the apparatus, and the delivery will be irregular from this tendency of air to pass in by or through the condensed liquid. If working beyond its capacity the drops will be blown out by escaping vapors. The first part of the rectification should not proceed too slowly, however, for the distillate then, from being nearly pure ether, evaporates rapidly, particularly if received in a large mouthed vessel.

As a guide to the strength of the preparation, it is proper to notice that about 1 f.℥ should pass over before the temperature of the boiling liquid rises above 150° , and that by the time the temperature reaches 176° 3 f.℥ should have been received. This 3 f.℥ of distillate should have a s. g. of .869.

The rectification is carried to 6 f.℥, and this distillate is diluted to $19\frac{1}{2}$ f.℥ with the remainder of the alcohol, and well shaken. It should then be transferred at once to small bottles well filled and stopped, and covered with dark wrappers.

If the first distillate be rectified fractionally, it will yield as follows:

1 f.℥	up to 157°	golden yellow	s. g. .8944	at 54°
1 f.℥	" 173°	paler	" .8640	" 60°
1 f.℥	" 176°	paler	" .8483	" 60°

giving a mean s. g. for the first 3 f.℥ of .869. The remaining 3 f.℥ is nearly colorless, and almost wholly alcohol.

Assuming that the first 3 f.℥ is a solution of hyponitrous ether in alcohol, it will consist of 7.94 f.℥ of the ether and 16.03 f.℥ of alcohol, and will therefore yield a finished preparation containing 5.1 per cent. of dry hyponitrous ether.

I have found in practice that nitric acid which is sold as "1.42" s. g. commonly has a true s. g. of 1.405 to 1.41, and the commercial acid sold as "1.38" is often as low as 1.35 in reality. So alcohol sold as ".835" is rarely below .836 and

often above .838, whilst I have not yet seen a specimen of "95 per cent" alcohol that was in reality below .8195 to .820 s. g.

If the second set of proportions given in brackets in the formula, be used with these commercial materials that are not weaker than the specific gravities given indicate, the mixture will boil at 180° but the boiling point will not rise so high as 186° till near the end of the distillation. Then however it is prone to rise higher and to produce more aldehyd in the distillate if not very carefully and slowly conducted. The same quantity 8 f. $\frac{3}{4}$ should be distilled over, and at similar temperatures. In the rectification about 7 f. $\frac{3}{4}$ will pass over below 150° to 156° , and 3 f. $\frac{3}{4}$ below 176° . The rectification should be carried to 5 f. $\frac{3}{4}$ only, and to this should be added 11 f. $\frac{3}{4}$ of alcohol, making 1 pint of finished sweet spirit of nitre.

The s. g. of the 20 f. $\frac{3}{4}$ first received in the rectification is .8782 which yields by calculation 6.94 f. $\frac{3}{4}$ of the ether s. g. .947 and 13.06 f. $\frac{3}{4}$ of alcohol s. g. .838, thus furnishing a product containing 5.2 per cent. of the dry ether, or practically the same with the other materials.

This preparation cannot be distinguished from the other by appearance or sensible properties, is neutral to test paper, but has a very different s. g.—.817 instead of .8415—and is liable to contain more aldehyd. Of its keeping properties I can say nothing, only that I believe that sweet spirit of nitre keeps best when it contains least water; and that much water will cause it to spoil very soon, no matter how carefully it may be kept.

Except that ordinary nitric acid is almost as liable to contain chlorine, as nitrate of potassa is to contain chlorides, the first of these processes on the small scale is nearly unobjectionable in practice, chiefly because the proportions of acid and alcohol are such that etherification occurs near the boiling point of the mixture, and near the boiling point of alcohol, where the temperature is most easily regulated. It avoids the violent reaction and difficult management of the Edinburgh and Dublin processes, and also avoids the loss attending the separation and manipulation of so volatile a liquid as these processes obtain, for as the alcohol distills over with the ether, and as the ether is slowly produced, its volatilization or loss is measurably controlled.

When the alcohol bears a smaller proportion to the acid than .

that given, the boiling point of the mixture is higher, and the reactions occurring at a higher temperature produce more aldehyd in the distillate, and are less easily and less economically controlled. When a much larger proportion of alcohol is used, it distils off before the proper reactions take place, the distillation of unchanged alcohol frequently continuing till the proportion is considerably less than that adopted in the formula, and the reaction when it does occur is of course correspondingly more active. The manner in which nitric acid and alcohol are mixed has a most interesting and important bearing upon the character of the reactions, as well as upon the period and rate at which these reactions occur. Thus the acid, if new and colorless, may be so slowly and carefully mixed with the alcohol that in the proportions given in the London officinal formula the whole of the prescribed distillate may be drawn over before any appreciable reaction occurs. In practice, upon a scale of $2\frac{1}{2}$ gallons of materials, this has twice occurred to me, without any particular care, or premeditated slowness in mixing. On the other hand if alcohol is slowly poured into nitric acid, a most violent reaction occurs before the proportions become equal, and this violent reaction continues long after the proportions pass the limit of 5 to 1, or until the cold alcohol quenches the reaction altogether. Such a mixture has the sensible properties of spirit of nitre. At some period, and in some portions of all mixtures as ordinarily made, some of these conditions of concentration are liable to occur, and thence to act as a starting point from whence general reaction may commence earlier or later, as the case may be. Hence the utility of a proper proportion, and of a temperature regulated at the lowest point of equable reaction, as the best, the safest, and the most economical means of controlling such variations in the reactions. The means of controlling within narrow practical limits, the strength of the preparation by the proposed formula is very satisfactory, and not difficult to accomplish. It consists simply in taking the specific gravity of that portion of the distillate in the rectification, which comes over below the boiling point of alcohol, which portion will contain nearly all the ether, and may for practical purposes be considered as a solution of hyponitrous ether in a small proportion of alcohol. The operator will then have three specific gravities, namely of the

mixture and its two elements (the small portion of water and aldehyd, and degrees of temperature within five or six being disregarded,) from which to calculate the proportion of each element, by the following rule :

“Take the difference of every pair of the three specific gravities, viz., of the compound and each ingredient ; and multiply the difference of every two by the third. Then as the greatest product is to the whole weight” or volume “of the compound, so is each of the other products to the weight” or volume “of the two ingredients.” The specific gravity of the mixture being above or below the mean of the two ingredients, indicates that the largest obtained proportional belongs on the side of the greater or less specific gravity.

The descriptions of sweet spirit of nitre as commonly met with are faulty. It is described by our Pharmacopœia in common with others as “colorless.” I have never seen it colorless when of fair quality, no matter by what process it may have been made. On the other hand, when of full officinal (U. S. P.) strength, it has a very decided greenish yellow tint. That it may be made colorless by repeated rectification of the ether, I have no doubt ; neither of the formula, however, accomplish this. It is said that it “slightly reddens litmus,” but when freshly made, or when well kept, it does not at all redden ordinary litmus paper until a few moment’s exposure to the air, on the paper, oxidizes the aldehyd or binoxide of nitrogen which it contains, in small proportion. This change occurs the more quickly, and is the more marked, as the preparation contains more water. The strictly officinal preparation begins to boil at 156° to 157° instead of “ 160° .” It is described as having a s. g. of .834, a density below that of the alcohol used, whilst the ether dissolved in the alcohol has a density of .947. In practice the s. g. varies from .840 to .841 when freshly made. It, however, loses in s. g. and in color, by age, without giving evidence of any other change. Several specimens put up at .840 to .842 were examined at periods varying between two years and five months, were found to have s. g. of .835 to .838, yet were not deficient in the proportion of ether yielded to fractional distillation.

Tests of character for this preparation are much needed, but it is not easy to find any that are simple and reliable. The least

objectionable method of estimating or comparing the ethereal strength is probably that of fractional distillation. One pint of officinal sweet spirit of nitre distilled from fragments of glass, by a water bath, yields a yellow distillate of one fourth of its bulk, whilst the temperature in the boiling liquid is below 180° , and such a distillate contains nearly all the hyponitrous ether of the preparation. This distillate, again distilled in precisely the same way, yields 1 f.℥ of distillate below 176° . This last, upon the addition of an equal bulk of water, added in a stream, and without agitation, yields a supernatant ethereal layer of $2\frac{1}{2}$ f.℥. The preparation by the proposed process yields about 3 f.℥. These results are based upon a number of trials, and are not too high, but will be found to indicate the comparative value very conveniently. Dilute solution of potassa, say equal parts of officinal solution and distilled water, is an excellent test for aldehyd in a spirit that is free from acid, or nearly so, provided time be given for its reaction to develop the color. I have never seen a specimen of good spirit of nitre that would not, in the proportion of equal parts, yield a decided straw yellow tint with this test within twelve hours. A yellow tint is usually perceptible within fifteen minutes, and the color thence grows deeper for twelve hours, when it becomes of a golden or brownish yellow of a deep hue. Where aldehyd is in undue proportion, this change occurs sooner, and becomes ultimately of a brown hue, even within an hour or two. The changes appear to take place more quickly in warm weather, and in a bright light.

The sulphuric acid test is less convenient and less to be relied upon in my hands.

In order to ascertain the relative strength the officinal preparation bears to the commercial article as supplied to apothecaries generally, six samples of sweet spirit of nitre were purchased and examined. Five of these samples were obtained from five of the largest and most respectable wholesale drug establishments in New York city, and one from a large establishment that is considered to be of second rate as to character. As these houses represent the commerce in medicines, under the most favorable circumstances, so the samples obtained from them may be considered as fairly representing the merchantable articles and the manufacturers that supply the demand. The six samples

were sold as the products of three manufactories, two of Philadelphia, and one of New York, two of these manufactories are very extensive, and probably supply a very large proportion of the medicinal preparations that are manufactured in the United States. The third is much smaller, and represents a pretty numerous class of manufacturers of special preparations. Three of the samples are alleged to be from the largest manufacturers, two from the second in extent, and one from the smaller. One of these manufacturers makes and sells five different kinds of Sweet Spirit of Nitre. Only two of these were examined, however, as these only, called "3 F" and "4 F" were met with in casually purchasing the six samples as a fair representation of the article that is now within the reach of general medical practice.

These specimens, then, probably represent the manufacture and the markets of New York and Philadelphia in this preparation. They were carefully examined by fractional distillation as above mentioned, and are placed in comparison with No. 7, which is a strictly official U. S. P. preparation 16 months old.

No.	Color.	S. G.	Reaction with Litmus.	Reaction with Sol. Potassa in 15 minutes	Etherial layer separated by water from 1 pint of spirit.	Estimated per centage of dry Ether contained.	
1	Good.	.839	Neutral.	Yellow.	50 m.	Below 1.7 p.c.	
2	Pale.	.840	"	"	1 f. 3 scant.	" 2. "	
3	Good.	.839	"	"	1 f. 3	" 2. "	
4	Good.	.881	Acid.	Colorless	1 f. 3 scant	" 2. "	" 4 F."
5*	Colorless	.911	"	Brown.	None.	" 1. "	" 3 F."
6	Good.	.851	Slightly acid.	Yellow.	1 f. 3. 35 m	3.16	"
7	Good.	.840	Neutral.	"	2 1/4 f. 3	4.2	"

It would appear from this table that a great majority of the physicians, whose patients obtain their Sweet Spirit of Nitre from ordinary sources, are prescribing a preparation that is considerably below half its proper strength; or often but little more than dilute alcohol. It is not surprising that little or no medicinal effect is obtained from such an article; or that when given in the now common doubled dose it produces the almost opposite effect of so much alcohol.

* This sample was opalescent when purchased, and this "muddiness" was ascribed by the person who dispensed it, to his having "rinsed out the bottle with water" previous to putting it up. In standing twenty-four hours it became clear by depositing a white sediment.

The official U. S. P. preparation is at best probably too strong in alcohol for the full medicinal effect of the hyponitrous ether, having probably less ether in it by 1 per cent, than the framers of the Pharmacopœia purposed it should have from the formula.

Hence the physician who predicates any part of the character of his profession upon the diaphoretic, diuretic, or febrifuge effects of this commercial preparation too often brings a discredit upon his science and art, which more justly belong to the preparation he employs. His patient distrusts his skill, and instinctively seeks for better results from some of the various pretended "systems" or quackeries with which he is surrounded.

It is not probable that bad colocynth or bad scammony are ever to be found in "Brandreth's Pills," but I have good reason to believe that the seed from the colocynth of which Brandreth's Pills are made, is separately powdered and sold, and that from such cheap varieties of powdered colocynth much of the extract is made upon which regular practitioners must rely.

In view of such illustrations, is it surprising that charlatanism flourishes, or that medical men are to be found in co-partnership, or in competition with it? The patient often doubts the quality of his physician or of his physician's science, but rarely reflects upon the tendency of commercial competition and a blunted moral perception upon the means on which physicians must rely.

It is said of Sweet Spirit of Nitre, as of Hoffman's anodyne and other preparations, that the commercial article is so very different from that contemplated in the *materia medica*, that it may be well to examine into the expediency of so modifying the Pharmacopœia as to produce the commercial article, because the curative effects or character of the article as a remedial agent must belong to it as found in commerce, rather than as produced by the official formula, since by far the greater part used in medicine is obtained through commerce. To all such reasoning and expediency, and to the increasing disposition to subsidize every science and art to the making of money alone, I offer my hearty and unqualified opposition; for it is mainly thus that the physician is losing one by one his valuable curative agents, and acquiring for his profession an uncertainty which does not belong to it, but which engenders a popular distrust as injurious to that profession as it is beneficial to charlatanism.

U. S. Naval Laboratory, New York, May 1856.

ON AMMONIO-FERRIC ALUM.

By WILLIAM HODGSON, JR.

Dr. James Darrach, of this city, requested me to prepare for him some of the "iron alum" mentioned by Dr. Wm. Tyler Smith, of London, in his recent work on "The Pathology and treatment of Leucorrhœa." So far as I am aware, the article mentioned had not been used in medicine in the United States; nor has its mode of preparation been hitherto distinctly stated in any pharmaceutical publication here or abroad. A few remarks on its character were re-published in the American Journal of Pharmacy for 1854, page 159, copied from the London Pharmaceutical Journal, in which, on Dr. W. T. Smith's authority, the "iron alum" is mentioned as "a more powerful astringent than common alum, and not liable to produce the stimulating effects of other salts of iron." But the paper seems to have attracted no attention here, nor are any specific directions therein contained to enable the druggist readily to prepare this so-called alum.

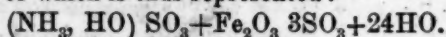
Dr. Smith says of the use of this salt in the above disease:—"In 1852, I began to administer it." * * * * "I found it remarkably efficacious, and have constantly prescribed it since that time. I certainly do not know of any other internal remedy which at all equals it in leucorrhœa. Since I began to use it, it has been employed by my colleagues, and by other physicians, but sometimes other compounds have been used under the name of iron alum." * * * * "The genuine iron alum contains no alumina whatever. There are two preparations of iron alum: one of them is a double sulphate of potash and iron, and the other a double sulphate of ammonia and iron." [He might have added a third, with soda in place of potash or ammonia.]

* * * * "I have prescribed the iron alum with ammonia, (which I now prefer, in most cases, to the similar salt with potash, because of its greater solubility,) in doses of from 3 to 6 grains, in infusion of columba, or in simple water, with some warm tincture, three times a day. It is similar in its action to the sesquichloride of iron, but while it is equal to, or perhaps more effective than this medicine as an astringent, it is less stimulating, more easily assimilated, and seldom causes any

nausea or headache. It generally produces a slight tendency to constipation, which may be obviated by an occasional aperient. From its astringent action on the bowels, it has been found useful in choleraic diarrhoea, dysentery, and other disorders in which tone and astringency are required."

Since I prepared this salt at the request of Dr. Darrach, it has been prescribed by him, and likewise by his father, Dr. Wm. Darrach, in a number of cases; and, as both these physicians have informed me, with a very satisfactory result, considering the short experience they have yet had with it. It seems, therefore, not improbable, that some demand for it may ensue, rendering it needful for pharmacutists to supply themselves with the identical salt mentioned by Dr. Smith as answering the indications better than the others bearing the common name of "iron alum."

It is well known that sulphuric acid forms several combinations isomorphous with common alum, yet containing no alumina. Thus, a "chromic alum" may be formed, in which the sulphate of sesquioxide of chromium replaces the analogous salt of aluminium—a "manganic alum," in which the sulphate of manganese replaces the salt of alumina—and a "ferric alum," in which the same replacement is assumed by the sulphate of the sesquioxide of iron. These salts may also, in like manner with common alum, be varied by the substitution of soda or ammonia for the potash of the latter salt. It is this last combination which is so particularly recommended by Dr. W. Tyler Smith, the chemical constitution of which is thus represented:—



This salt is readily prepared, if certain precautions are observed; but as my own first and second attempts to produce it failed of entire success, I have thought that a record in the pages of the Journal, of the process by which I obtained a very satisfactory article, might be useful to other pharmaceutical chemists.

The formula for preparing the "Ammonio-Ferric Alum" may be thus stated:—

Pure crystallized protosulphate of iron,	3viij (troy,)
Sulphuric acid,	f.3vij.
Nitric acid, (common strength, or 36° B.)	f.3iiss. (vel q. s.)
Sulphate of ammonia,	3ij 3ij. (troy.)

Boil the sulphate of iron in two pints of water, and add to it the sulphuric acid; when dissolved, add, in small portions gradually,

the nitric acid, boiling for a minute or so after each addition, until the nitric acid ceases to produce a black tint in the liquor. The complete change of the proto-sulphate of iron to a persulphate, is, towards the last, accompanied by a violent boiling and evolution of deutoxide of nitrogen; rendering it necessary to use a vessel for the operation capable of holding double the quantity put into it. Boil the solution of persulphate of iron to about half its volume; then add the sulphate of ammonia, and set it aside for spontaneous evaporation and crystallization. Wash the crystals rapidly but thoroughly in very cold water, then press them wrapped in copious folds of bibulous paper, and afterwards dry them in the open air. The crystals should be nearly colorless, but with a slight dark tint. When perfectly formed, they are octohedrons, but are usually truncated. Further experience may possibly dictate some improvement in the above proportions, but they are sufficiently near to produce good results.

Philadelphia, 6th mo. 9th, 1856.

ADDENDUM TO "MORE POISON IN 'SODA WATER.'"

On page 102 of the present volume of this Journal, will be found a brief article from my pen, intended to show the presence of *lead* and *tin* in "soda water;" but especially the more poisonous metal, lead. For besides the chlorides of tin, I believe our toxicologists do not acknowledge any poisonous oxide or salt of this metal. Notwithstanding the existence of tin in the carbonated water was but a secondary matter of concern, yet the presence of that metal was inferred under circumstances so adverse to the deductions from the common routine of analysis, that I was induced to say in the article alluded to: "I may refer to the reactions of ferro-cyanide of potassium and tin more particularly at another time."

The subject, however, escaped my attention, until it was recalled by a letter from a correspondent, (though personally a stranger to me,) of Lowell, Mass. After the perusal of my article, already cited, he proceeded to analyse some of the carbonated waters of the shops of that city. He found the specimen examined to be "strongly impregnated with *copper* and *lead*;" but no indications of tin presented themselves. To ob-

tain the same reactions that I did, he "added to filtrates 2 and 4 [equivalents of my experiments 8 and 9], ferro-cyanide of potassium; and, in both cases, a fine blue precipitate was produced. Knowing," continues my correspondent, "that the soda water came in contact with iron in no stage of its manufacture and sale, suspicion fell upon the water from which it was made. To decide the point, half a gallon was taken from the pump, evaporated and tested for iron, when its presence was made evident; thus accounting satisfactorily for the presence of iron in the soda water." And he queries whether the reaction observed in my experiments 8 and 9 could not have been occasioned by the same cause.

Having repeatedly, yet contrary to all published authority, obtained results from the reactions of ferro-cyanide of potassium with tin, in all respects the same as those with the filtrate from my 4th experiment, I could only suppose that tin was retained in the filtrate by the possible presence of some agent like that of chloride of ammonium in solutions of other metallic oxides, &c.; but why should the precipitate with $K+Cfy$ be blue?

In compliance with the suggestion of my friend, I obtained a quantity of water from the well used by the manufacturer of the "soda water," and evaporated it to dryness. On re-dissolving the residue in a small quantity of dilute nitric acid, and testing the resulting solution with sulpho-cyanide of potassium, and with ferro-cyanide of potassium, perceptible indications of iron were manifested.

I was now induced to question the purity of the tin experimented with on the former occasion. It was obtained for pure tin. Parcels were subjected to the action of acetic acid and of nitric acid. In both cases the sulpho-cyanide and the ferro-cyanide just named, produced the characteristic indications of iron. Sulphydric acid was passed into an acetic acid solution of the metal, and the filtrate, after boiling, treated with ferro-cyanide of potassium; as formerly, a "blue tinge," or rather pea green color followed.

In all probability, therefore, the two metals found in the carbonated water of the new apparatus, were lead (certainly) and iron instead of tin; the iron being derived, not from the apparatus, but from the water charged with the gas.

JNO. T. PLUMMER.

QUININE AND CARBONATE OF AMMONIA IN PILLS.

By J. M. MAISCH.

In Washington, D. C., several years ago, I often had to prepare pills composed of sulphate of quinia and sesquicarbonate of ammonia. I did not meet with similar prescriptions again until lately here. Of such a combination some physicians seem to think very highly, and a few remarks on the subject may not be out of place.

Sulphate of quinia and carbonate of ammonia decompose each other, and under the evolution of carbonic acid, form sulphate of ammonia and the alkaloid quinia; the carbonic acid, therefore, must be got rid of before the two salts can be made into pills, as a generation of the gas, after the pills are rolled, causes them to swell considerably and burst into pieces. The quickest way to attain that end, is to rub both salts with strong alcohol, which, acting as a solvent, induces their mutual decomposition, and being itself volatile, evaporates easily from under the pestle; the residue is then to be mixed with the extract of gentian, which is usually prescribed. Prepared in this way, the pills keep well, but the question arises, do they really contain what the physician intends to give? The carbonate of ammonia is ordered for its stimulating power it appears, and sulphate of ammonia cannot have it in the same degree. It may therefore be best, and the physician consented to this suggestion, to prepare first the quinia from its sulphate, which may then be mixed without decomposition with the sesquicarbonate of ammonia.

If it should be desirable to exhibit the medicine in form of powder, the bicarbonate of ammonia must be used in place of the sesquicarbonate, and if it is to be mixed with the sulphate of quinia, it is well to dry this salt first at 212° F., and to make the powder fresh every day; the best plan, however, is to use the alkaloid in lieu of the salt, and enclose the powder in waxed paper or tin foil.

Fresh prepared sulphate of quinia after being pressed and dried between bibulous paper, commences to decompose as soon as rubbed together with the medicinal carbonate of ammonia; but after 6 equivalents of its water of crystallization are expelled by exposure to dry air, it may be kept in a dry place, mixed

with the bicarbonate of ammonia for a short time without an apparent alteration; but at the end of two weeks, I found it to have lost its carbonic acid, and as it still contained some ammonia, it may then be a mixture of sulphate of quinia with a little sulphate of ammonia and a corresponding amount of free quinia.

New York, May, 1856.

ON ACETIC TURPENTINE LINIMENT.

To the Editor of the American Journal of Pharmacy:

Dear Sir,—What is Stokes' Liniment, alias Linimentum Alb.? How is it made? What is the best course or rotation to be pursued so that the resulting compound may form a permanent and pleasing liniment?

The mixture has been compounded to the satisfaction of prescribers over several forms. I desire that some form be recommended to pharmacutists, so that in view of a difference of opinion arising, some authority may be pointed to with confidence.

The receipt used in my store for years, and for which I have no authority except as a recorded manuscript, and which has given invariable satisfaction, is as follows:

Take of Acetic acid,	f.℥ii.
Oil of turpentine,	f.℥ii.
Yolk of egg,	one.
Oil of lemon,	℥i.

~ Rub the oils together with the yolk of egg, adding gradually the acetic acid. Triturate well, adding slowly and with trituration rose water f.℥iv. Mix and form the liniment.

I have dispensed and used another formula with equal satisfaction to my customers as follows:

R. " Rose water,	f.℥iiss.
Yolk of egg,	one.
Oil of Turpentine,	f.℥iii.
Ol. Lemon,	℥ss.
Acetic acid,	f.℥i.

To the yolk of egg slowly add the rose water and rub together in the mortar; then add the turpentine and oil of lemon. Pour the mixture in a pint bottle, and agitate to mix thoroughly, then add the acid and agitate quickly and briskly. It must be kept well corked."

This receipt and directions have been taken from the American

Eclectic Dispensatory, edited by John King, M. D. I have seen even other forms from which linimentum album has been formed, but have not access to them. Your own suggestions and recommendations I know will be received with much pleasure by those in the trade. I know there are others *like myself* who really do not know which (if either) is the proper formula, neither are many of *those who order it* able to instruct us.

Very truly yours,

LAENO.*

Baltimore, April 29th, 1856.

*[NOTE BY THE EDITOR.—The preparation known as “Stokes’ Liniment” is occasionally prescribed in Philadelphia, but it is usual with physicians to write out the formula. These prescriptions are found to vary in the proportion of ingredients, as they have been taken from one or the other writer, or as varied by the prescriber. The following form, taken from Griffith’s Medical Formulary, 2d edition, 1854, page 333, is called “Acetic Turpentine Liniment,” and is attributed to Dr. Stokes.

Take of Oil of turpentine,	three fluid ounces,
Acetic acid,	five fluid drachms,
Rose water,	two and a half fluid ounces,
Essence of lemon,	four fluid scruples,
Yolk of egg,	one. Mix.

No directions are given for mixing the ingredients.

The manner of preparing it is to mix together the volatile oils and add them gradually to the yolk of egg, previously rubbed down with a little of the rose water, and finally the acid is added and the remainder of the rose water with trituration. At first this liniment tends to separate by standing, the oil of turpentine rises to the top, holding in solution the coloring matter of the egg. With occasional agitation a permanent emulsion is produced, and the yellow color disappears.

The Liniment known as “St. John Long’s Liniment,” and which acquired some celebrity as an application to the chest in pectoral complaints, is quite analogous in composition to the above, being according to Dr. Beasley (Prescription Book, page 350, Amer. Edit.) composed as follows :

“R. Terebinthinae olei,	ʒiij.
Acid. acet. fort,	ʒss.
Aquæ rosæ,	ʒiiss.
Olei limonis,	℥. v.
Ovi vitelli, q. s.	

Misce secundum artem. Fiat Linimentum pro pectore.”]

ON THE BERRIES AND LEAVES OF ILEX OPACA.

By DILLWYN P. PANCOAST.

(Extracted from an Inaugural Essay.)

The *Ilex Opaca* (the American Holly) is one of the most beautiful of our native evergreen trees; it is much used for ornament during the winter holiday season, the bright scarlet of the berries forming a beautiful contrast with the dark luxurious green of its foliage. This variety appears to be entirely indigenous to the Western Continent, being found throughout its Atlantic section from Maine to Louisiana, and is particularly abundant in the State of New Jersey. It is usually a small or middling sized tree, seldom attaining, even in the most favorable situations, an altitude of more than thirty feet, and in our latitude, rarely one so great. The leaves and fruit are the parts used in medicine; the former by their peculiar appearance render the tree quite distinguishable when associated with others of the forest class; they have a bitter somewhat austere taste. The latter are about the size of a pea, possessing a taste at first sweetish, afterwards very bitter, and extremely nauseous. They are principally used in domestic practice, as an alterative, and by practitioners of the "Eclectic School," by whom they are highly esteemed as anti-intermittent, febrifuge, tonic and diaphoretic.

The berries are said also to possess emeto-cathartic properties; we have known six of them to produce brisk catharsis, attended by considerable nausea and headache. From the leaves of the *Ilex aquifolium*, a closely allied European variety, Labourdais obtained an amorphous extractive principle, for which he proposed the name of "Ilicin." As far as I am aware, however, no analysis of the variety under consideration has ever been made.

With a view therefore of ascertaining something with regard to its properties, the following experiments were instituted.

Chemical Investigation of the Fruit.

Solution of gelatin and tartar emetic produced no change in an infusion made from the bruised berries. Tincture of the sesquichloride of iron gave a dark, olive-green precipitate, indicating

the presence of either tannic or gallic acid ; but, as heat caused no change, and, upon standing, a dark olive-green substance was deposited, it was inferred that *tannic acid* alone was present, and of that variety which produces green precipitates, with solutions of the per-salts of iron.

A portion of the dregs left from a decoction were heated for some time in a weak solution of carbonate of soda, then filtered ; the resulting liquid produced a copious flocculent precipitate upon the addition of chlorohydric acid, which was entirely dissolved by acetic acid, indicating *pectin* to be one of the constituents.

Two ounces of the berries were introduced into a retort, containing one pint of a strong solution of chloride of sodium, and distilled until six fluid ounces had passed over ; the distillate possessed strongly the odor, and to a slight degree the taste of the fruit, but no evidences of a volatile oil could be obtained.

A quantity of the seeds separated from the surrounding mass were bruised and treated with boiling water, which produced a slight coagulation ; a solution of bichloride of mercury added to this caused a white curdy precipitate, proving the presence of albumen.

Three ounces of the bruised berries were macerated in cold water twenty-four hours, then strained ; this process was repeated several times, until the bitterness seemed nearly all exhausted ; the resulting infusions were then mixed, a solution of subacetate of lead added, filtered, and a stream of sulphohydric acid passed through it ; the sulphuret of lead was then allowed to precipitate, after which it was again filtered and evaporated to the consistence of an extract. One half of this extract was dissolved in two fluid ounces of distilled water, acidulated with acetic acid, then added to a cream of lime, and after standing for some time thrown on a filter and allowed to drain. The precipitate was next washed and dried, after which it was treated repeatedly with boiling alcohol, and the alcohol evaporated to dryness. This process was unattended with any notable results.

The other half of the extract, prepared in the last experiment, was dissolved in a small quantity of distilled water, poured into a bottle, of which it filled about one-third, treated with an excess of the weaker solution of ammonia, and afterwards re-

peatedly agitated with ether, the ether rising to the top upon resting, was decanted, and allowed spontaneously to evaporate. The result was a minute colorless deposit of crystalline scales, tasteless and inodorous.

Eight ounces of the contused berries were boiled in a pint and a half of water down to twelve fluid ounces; the resulting decoction was of a dark brown color, extremely bitter, and nauseous to the taste; it was then strained, filtered, and passed repeatedly through a column of purified bone charcoal; by this process it was deprived of much of its bitterness and color. The charcoal was then washed, dried, and treated with boiling alcohol; this was evaporated to a syrupy consistence; diluted with distilled water, and boiled with a much smaller amount of bone coal than was before used; this was then drained, washed, dried, and treated with boiling alcohol as before, succeeded by a treatment with boiling ether; the resulting liquids were then mixed, evaporated to the consistence of a thin syrup, placed in a bottle, a little pure carbonate of potassa added, after which ether in small quantities was repeatedly poured in, violently shaking upon each addition; this upon reposing formed a supernatant liquid, which was decanted and allowed to evaporate.

The result of this treatment was a deposit of minute acicular crystals, having an intensely bitter taste with slight acidity; freely soluble in ether, soluble also in water and alcohol. Sulphuric acid added to a portion of it dissolved in water, caused slight turbidness, and, upon standing, a white crystalline deposit. Solution of bichloride of platinum produced no change. Tartaric acid caused a slight bluish opalescence or "quinescence," but no deposit. Nitric acid and tr. iodine no change. Solution of tannic acid gave a white precipitate. This principle appears to be the one upon which the bitterness of the fruit is dependent.

Investigation of the Leaves.

A strong alcoholic tincture was of a dark green color, and upon evaporating to dryness left a dull green, insipid powder, without any marked peculiarities.

An ethereal one, made as the above, from the half-dried, sliced leaves,—their dense and coriaceous nature preventing a satisfactory contusing of them,—was similar to it in appearance, and

yielded chlorophylle, when treated according to the process of Graham.

By a treatment similar to that of the berries, tannic acid of the same variety was detected. One ounce of the leaves were macerated in a pint of water acidulated with two fluid drachms of strong acetic acid for ten days, then thrown in a displacement apparatus and the liquid repeatedly passed through. The resulting infusion was of a yellowish or light brown, with a taste slightly bitter. It was next saturated with magnesia, filtered and evaporated to about two fluid ounces, then poured into a bottle, a portion of carbonate of potassa added, treated with ether, the ether decanted, and, as in former experiments with the fruit, allowed to evaporate spontaneously. The result was a light brown resinous extractive matter, soluble in water, but much more so in alcohol and ether, possessing a slight bitterness.

Three ounces of the leaves were chipped up and boiled in four pints of water down to one pint, then strained and expressed, the decoction filtered and evaporated to one half; the remaining liquid had a dark greenish brown color and an extremely bitter taste; it was then boiled with a small quantity of purified bone charcoal, which deprived it of much of its color and bitterness. The liquid was next poured off, the coal washed and dried, after which it was treated repeatedly with boiling alcohol, and that evaporated to dryness. The result of this treatment was a green extractive substance—the alcohol dissolving out a portion of the green coloring matter,—having a resinoid appearance and fracture, and an intensely bitter taste; it was partially soluble in cold water, entirely so in alcohol and ether, and does not appear to be hygrometric. It evidently contains all of the bitterness due to that portion of the plant from which it was obtained; various attempts to procure from it a crystalline principle have been attended with no definite results.*

From the above experiments it may be inferred that the constituents of the fruit of the *Ilex Opaca* are, *Tannin*, *Pectin*, *Albumen*, and two *crystallizable principles*; one inodorous, tasteless and inert; the other with no odor, but an intensely bitter taste, probably the one upon which the main activity of the plant is dependant; also salts of *Potassa*, *Lime*, and *Mag-*

[By a careful analysis of the ashes of the berries the author determined the presence of potassa, lime, magnesia, and protoxide of iron.—EDITOR.]

nesia, and the *Protoxide of Iron*; those of the leaves to be *Tannin*, of the same order as the above, *Chlorophylle*, a *Resinous extractive matter*, and salts of *Potassa* and *Lime*.

ON THE ALCOHOLOMETRIC SCALES OF RICHTER AND TRALLES.

To the Editor of the American Journal of Pharmacy:—

DEAR SIR—In the Journal of the College of Pharmacy for May, 1856, I observed an article on the specific gravity of alcohol, which, as a manufacturer of specific gravity apparatus, attracted my notice. In the commencement of that paper, the dilemma of Mr. C. Mead is to be noted, who, purchasing alcohol for 80 per cent., finds upon trial that it is nearly 85 per cent. by weight of the U. S. Dispensatory, and nearly 90 per cent. by measure, according to Tralles' tables in Ure's Dictionary. Certainly there appears here no cause of complaint on the part of the purchaser, who gets a better article than he contracted for, an accident which I am confident does not often occur elsewhere. Mr. M. next states, that in his trial of the above alcohol he weighed it and found its specific gravity to be .834 at 60° F., meaning of course that an accurately made 1000 grain specific gravity bottle held only 834 grains of the alcohol. This may well be called the *experimentum crucis*, surpassing in accuracy all other methods of ascertaining the specific gravity of liquids. According to that observation, there can be no doubt but that his conclusions were correct, viz: that the alcohol he purchased was actually nearly 85 per cent. by weight, or nearly 90 per cent. by volume. Mr. M. further remarks, that he is quite sure that the table of the U. S. Dispensatory is not the standard by which distillers' instruments here are made. If by the distillers' instruments, the Berlin hydrometers, or those made here and copied after them, are meant, then Mr. M. is likewise correct, and we are obliged to admit that the Berlin instruments are not quite so infallible as many imagine; unless it be supposed that all the printed tables given in the various works, which will be referred to presently, are erroneous.

In Mr. A. P. Sharp's reply to Mr. Mead, it is stated, that according to order of Congress, the percentage of alcohol is to be measured by volume, and this agrees with the usage of all manu-

facturers and dealers, who always sell by measure and not by weight. By not paying proper attention to this fact, many vexatious disputes arise between buyers and sellers, one selling by measure the other testing by weight, and finding the percentage much less than it was represented to be.

We are also informed that the U. States have adopted Gay Lussac or Tralles' alcoholometer, meaning, I suppose, the scales graduated according to the experiments of those observers.

These scales, however, are not identical, being the results of independent experimenters; Tralles' scale being made for the English Government excise, and Gay Lussac's for that of France. Besides the discrepancies arising from the experiments themselves, the normal temperature of the two observers are different, Tralles' scale indicating the percentage at 60° F. and Gay Lussac the same at 59°. The variation from this case is certainly not very important, but is farther increased by the fact of Tralles' taking water at its greatest density (39½° F.) at 1.000, thus making zero or commencement of his scale to equal .9991, while Gay Lussac reckons the density of water at 59° F. to equal 1.000. In all the instruments I have seen, the zero of Tralles' scale commenced at 1.000 sp. grav.; this does not interfere with their accuracy, for the specific gravities of all the percentages being increased in the same ratio, by dividing by .9991, or which is nearly the same, adding .0009 we obtain a corrected scale beginning at 1.000.

The greatest difference between the two scales is about 1 per cent., varying in different parts of the scale, and from some observations I have made, I should judge that the name "Gay Lussac" and "Tralles" is used indiscriminately.

The Berlin made alcoholometers, when examined with reference to Tralles' tables, are in general very reliable; I have tested many of them with the specific gravity bottle at various points of the scale and found them correct. The table of Tralles referred to, may be found in Ure's Chemical Dictionary, Booth's Encyclopedia, Muspratt's Chemistry, &c.; those of Gay Lussac in Gmelin's Hand-Book of Chemistry, vol. i., and in Booth's work.

The corrections for temperature generally adopted, namely, to increase the observed percentage 1 degree, for every 5 degrees the thermometer stands below 60° F., and to decrease the

percentage the same amount for every 5 degrees below 60° , is tolerably accurate, more so in strong alcohol than in dilute, and the nearer as the temperature approaches 60° . A more reliable method would be to use a table of corrections for all temperatures and percentages; such a table is given by Ure and Booth, art. Alcoholometry.

The foregoing remarks on the correctness of the Berlin alcoholometers refer solely to the scale marked "Tralles," and indicating the percentage of alcohol by volume or measure. In the concluding paragraph of Mr. Sharp's answer, there is mentioned "Richter's scale, which shows the per cent. of alcohol by weight."

Now this scale will be found upon examination to be quite erroneous, although placed upon instruments made by celebrated makers in Berlin. It may possibly be a scale intended originally for local or particular use, but that it indicates percentage by weight it certainly does not. This assertion I feel confident will be rendered evident by the following remarks:—

In chemical analysis and investigations, alcohol is always used by weight, and hence very accurate determinations have been made of the specific gravities of various mixtures of alcohol and water by weight. In Booth's Chemistry, (art. Alc.) a table of comparison is given between percentages by volume and weight. For illustration I give a few of the numbers. 20 per cent. by vol.=16.28 per cent. by wt. 40 by vol.=33.4 by wt. 60 by vol.=52.2 by wt. 80 by vol.=73.6 by wt. 90 by vol.=85.75 by wt. Upon comparing these numbers on the scale of several genuine Berlin hydrometers, by Lohme and others, I find 20 per cent. vol.=13½ wt. 40 vol.=27⅞ wt. 60 vol.=46 wt. 80 vol.=69 wt. and 90 vol.=81½ wt., results which differ 5 or 6 degrees from the table above!

Again, by taking the specific gravities corresponding with these percentages and comparing them with the tables given in various works, we observe the same discrepancies.

These tables of the specific gravity of all percentages of alcohol by weight are found in the U. S. Dispensatory, in Gmelin's Chemistry, vol. viii, in Turner's Chemistry, in the Prussian Dispensatory, published in Leipsic; an original set of experiments made by Fownes, is given in his Chemistry, agreeing closely with the others; the same table is re-published in Muspratt's new work

on Chemistry; and finally there is seen in "Meissner's Areometry" (Vienna), an engraving of the two scales, marked "Tralles" and "Richter," placed side by side in conjunction with a scale of specific gravity. All these authorities agree closely with the table of comparison by Booth, and prove conclusively that the scale of the Berlin instrument marked Richter, does not indicate percentage by weight correctly, as has been asserted and generally believed.

I trust that my motive for making the above remarks may not be construed into a desire to detract from the merits of the foreign instruments used here; but as a manufacturer of similar instruments, I do not desire, where such wide discrepancies occur in comparing my hydrometers with others, to have the difference pointed out as a proof of error on my part.

Under the title of foreign instruments, I include most of those sold in this country as imported, but actually made here and copied after the genuine Berlin ones more or less carefully, according to the price.

It may be said, perhaps, that as the scale of percentage by weight is but seldom used, the error is not a very important one; still as it *may* be referred to, all source of error should be avoided, particularly in an instrument of such general employment.

What I have said may be the means of explaining away unpleasant differences, which are often occasioned by the use of erroneous instruments. Yours, respectfully,

W. H. PILE.

Philadelphia, June 13th, 1856.

[NOTE BY THE EDITOR.—Dr. Pile informs me that the scales of his alcoholometers are computed directly from the published tables to which he refers. He also graduates hydrometers, showing specific gravity, intended more particularly for Pharmacutists and Chemists; these latter instruments are by far the most important, and second only to the specific gravity bottle in the scope of their application, and in my experience with them, are sufficiently accurate for all practical purposes.

We have examined several of the Berlin alcoholometers, and find the numbers as given in the above article to be correct. The tables are also quoted correctly.]

ON A COMPOSITION FOR ATTACHING LABELS.

By FREDERICK STEARNS, Pharmaceutist.

Having noticed in the March number, the present year, of the American Journal Pharmacy, an article upon "Unalterable Labels for the Cellar," it occurred to me that the method I have employed for some years, in giving adhesiveness to dispensing and other labels, might be of some service to the readers of the Journal. It is as follows :

Take of white glue (Cooper's best) *three ounces*, (avoir. ;) refined sugar *one and a half ounces* ; water *ten fluid ounces*, or a *sufficient quantity*. Dissolve by the aid of a water-bath, and use while warm, applying it by means of a suitable brush to the reverse side of the labels while uncut or in sheets. After being dried and moderately pressed they are ready for cutting.

A little experience will show the propriety of increasing or lessening the amount of water used ; for instance, if the paper is thin and well sized, more may be added ; on the contrary, if the paper be thick and without sizing, less is required ; in all cases it should be quickly and evenly spread upon the paper.

It is not applicable to the purpose of a common paste, as it can only be used while warm.

I have found the use of it to possess these advantages : Labels prepared with it adhere more firmly than when any other adhesive substance is used ; it does not penetrate, and thus disfigure the label, and when applied to glass they never become loose, as is often the case when acacia and tragacanth are used, when moistened with saliva. No disagreeable impression is left in the mouth, as with dextrine, and it would well supply the place of that material upon Post Office stamps, gum tickets, etc.

Detroit, June 10th, 1856.

CONTRIBUTIONS TO TOXICOLOGY.

[Translated From Archiv. d. Pharm. and Buchner's N. Repertorium.]

By JOHN M. MAISCH.

Poisoning by Farina Amygdalæ Amaræ. By X. LANDERER.

A lady suffering from a herpetic eruption on several parts of the body, was ordered by her physician to use bran baths, which she, however, changed for almond bran baths. After being a few minutes in the warm bath, she was seized with dizziness and anxiety, vomiting, weakness and convulsions of the extremities, so that she had to be lifted out of the bath. After giving her cooling drinks, the symptoms gradually disappeared after several hours, with the exception of a great weakness that lasted several days. The bran consisted of the residue (after expression of the oil) of sweet and bitter almonds.

Crusta lactea is one of the most common diseases of the skin among the children in Greece, where at least 40 to 50 per cent. suffer with it. In such a case a mid-wife recommended bathing of the parts with bitter almonds, which had the effect of drying up the eruption and clearing face and head; but at the same time the child began to cough, exhibiting symptoms of bronchitis and laryngitis, causing death in a few days. These symptoms may have been caused by a toxication by hydrocyanic acid, or more probably by the rapid healing of the eruption stopping the secretion. Very often in the Orient, children die of hydrocephalus, following a quick cure of crusta lactea.—(*Buchner's Neues Repert.* iv., 453.)

Action of White Lead on Birds. By PROF. FALCK, of Marburg.

From his numerous physiological experiments, the author arrives at the following conclusions:

1. White lead acts poisonous on the domestic birds.
2. In relatively large doses mixed with the food, it decreases or destroys the appetite.
3. This decrease of appetite is not the consequence of an incipient inflammation of the first passages, but of a dyspepsia.
4. The saturnine dyspepsia, analogous to that of man, seems to be caused by a precipitation of the ferments of the stomachic

juices, and an invisible alteration of the mucous membranes of the first passages.

5. This lead-dyscrasy ceases after changing to the ordinary food, and therefore is not rooted in a deep alteration of the body. (Only one experiment.)

6. During the formation of the dyspepsia, the blood and organs of the birds are in a state of constant change and excretion by perspiration and excrements.

7. As the blood and organs under the existing dyspepsia cannot be nourished in the usual order, their mass must diminish.

8. To the dyspepsia a *tabes* is very soon added, which must be called "*tabes saturnina*."

9. The dyspepsia can be joined by *anæmia* or *oligæmia*, if life is not destroyed too soon.

10. The decrease of the weight of the body under the influence of lead, is the same as that caused by the want of food.

11. The temperature of the body falls with its diminishing mass.

12. The lead-dyscrasia and *cachexia* of the human body do not occur with birds.

13. Lead-colic seems to occur, but seldom with birds.

14. The liver seems to secrete much bile under the influence of white lead.—(*Deutsche Klinik* 1855, 19—23.)

Poisoning by Tincture Sem. Colchici. By DR. ROUX, of Toulon.

On December 7th, 1851, five patients at the Prisoner's Hospital received, by mistake, 60 grm. tinct. sem. colchici, instead of tinct. cinchonæ. Three hours afterwards two of the patients experienced violent burning in the epigastrium, colic, vomiting, purging, slow pulse, paleness and coolness. After two and a half hours the five patients showed these symptoms increased, with burning heat in the pharynx and along the œsophagus, constant thirst, insupportable pains in the epigastrium and abdomen, numerous stools of a yellow color without slime or blood, consciousness, sensibility, mobility and power of speech unaltered, pupils normal; the pulse of two was imperceptible, one felt a continuous tingling in the ears.

During the following night three died. On the following

morning the remaining two complained of intense burning in the throat, thirst, colic, tenesmus, pains in every limb, dizziness, coolness of the skin, livid lips and nails, and died with full consciousness in the course of the day.

Autopsy 36 hours after death.—Calm expression of face, eyelids open, pupils normal; nails, hands and some parts of the skin blue; digestive organs no ulceration, no inflammation in pharynx and œsophagus; stomach and intestines contained little gas, but much of a turbid liquid; mucous membrane softened, somewhat red-spotted, without ulceration; liver full of blood; gall bladder a moderate quantity of bile; kidneys contained much blood, bladder a little urine, its membrane with some red spots; heart flabby, with little black blood and fibres; vena porta and vena cava inferior, enlarged; all blood gelatinous; lungs healthy, no hypostasis; in the pleuræ, pericardium and peritoneum no serum; brains and spine considerably injected; meninges vividly red, a cut through the ventriculæ ejects blood; the spinal cord is softened.

All muscles are of a free red color, hard and without any sign of decomposition. The analyses of the vomited matter, stools and serum, showed to contain tinct. sem. colchici, by comparison with the reactions of other liquids mixed with the same. Dr. Roux thinks colchicum destroys human life by its action on the cerebro-spinal system, and not by producing inflammation of the digestive organs.—(*Union Medicale*, 1855.)

NOTE.—The French official tinct. sem. colchici is prepared by macerating 100 grms. of the seeds in 400 grms. of alcohol of 56 per cent.

Method to discover Phosphorus. By PROF. E. MITSCHERLICH.

The most delicate test for phosphorus is the distillation of the suspected substance, especially flour paste, with a little sulphuric acid and water. The apparatus is a simple one; it consists of a flask, (a retort is objectionable,) to which is attached a long glass tube, connected with a glass cooler, which consists of a cylinder, through the bottom of which reaches the cooling pipe into a bottle; a stream of cold water is conducted to the bottom of the cylinder, displacing the warmer water at the top. Where the aqueous vapors from the flask reach the cooling tube, a lumination is constantly observed in the dark, usually a luminous ring.

From a mass weighing 5 oz., containing 1.40 grain = 1-1000 per cent. = 1-100000 part of phosphorus, 3 oz. may be distilled off, which lasts over a half hour without cessation of the lumination. In one experiment the distillation was stopped at the end of half an hour, and the flask left open in contact with the air for two weeks; when the distillation was commenced again the lumination was as perfect as before. If ether, alcohol or turpentine are present, they will prevent the lumination, which commences as soon as they have passed over.

At the bottom of the last bottle, globules of phosphorus are found; 5 oz. substance, containing one-third grain phosphorus, gave so many globules that one-tenth part of them would have been sufficient to distinguish them as phosphorus. Larger quantities, which contain much phosphorus, may, during the process of distillation, oxydize sufficiently that phosphorus acid may be found by nitrate of silver and bichloride of mercury. But this can never be a proof for poisoning by phosphorus, unless it has been found itself.

To determine the volatility of phosphorus and phosphoric acid, two drachms of a mixture of the two obtained by oxydation in the air, were distilled several times with water; by the magnesia-ammonia test not a trace of the acids could be found. But nitrate of silver was colored brown, afterwards precipitating some imponderable brown floccules, and bichloride of mercury was rendered slightly turbid. The distillate of diluted phosphoric acid, with a little dust taken from an unoccupied room, and of a small piece of a decayed human stomach, with water, gave the same reactions, on which, therefore, in forensic analysis, no reliance can be based.—(*Journal f. Prakt. Chemie*, 1855, No. 20.)

Action of Red Phosphorus.

Reynat and Lassaigue, by a series of experiments, have found that red phosphorus in the dose of 5 grammes is not poisonous to dogs, nor to birds in the dose of 3 centigrammes, and that in general it is without action on the mucous membranes.—(*Rép. de Pharm.*, 1854.)

INTRODUCTION OF THE CULTURE OF CINCHONA INTO
JAVA.*

There are, in various countries, certain raw products which cannot be collected—or, more properly, which *never are* collected—without the complete extirpation of the plants which afford them. The gutta-percha trees of the Indian Archipelago are a lamentable example of this; and another, even more lamentable, the cinchona forests of the South American Andes. The annihilation of the latter goes on with such giant strides, that the noble cinchona forests will, in a few years, cease to exist. The inhabitants of the Andes never think of future plants, and the duty recently laid by the State of Ecuador upon the exportation of the bark will not diminish the demand, and can, under the most favorable circumstances, put only a partial check on the evil. Even for the propagation of the species the needful seeds will be scarcely obtainable—perhaps, indeed, no longer so; meanwhile, there is no doubt the use of quinine will continue, as at present, on the increase. How great would be the difficulty, if the supply at last ceased!—if the poor fever-patient asked in vain for the remedy which now brings him such speedy relief—if the physician had to seek, perhaps without success, for some new agent to subdue fever!

A German *savant* has the merit of having foreseen this undesirable state of things, and of having proposed a practical method of warding off the impending evil. Professor Dr. Miquel, of Amsterdam, in the year 1846, threw out the idea of introducing the culture of the cinchona into the mountainous districts of Java, and, for the promotion of this object, presented to the Ministry of the Dutch Colonies a memorial, in which he demonstrated the possibility of such introduction, which later experiments on the island have completely confirmed. The ministry willingly took up the memorial, and consented unconditionally, according to the proposition, to send a qualified, careful person to Peru, in order to import thence into Java, by way of the Pacific Ocean, a whole ship-load of plants and seeds. M. Hasskarl was charged with the expedition; and, before one year had elapsed, arrived safely with his cargo in Java, where he found

* *Bonplandia*, Dec. 15th, 1856:

the seeds sent out by him *via* Holland already in luxuriant growth. Unfortunately, many plants were lost during the voyage across the Pacific, notwithstanding which there remained a sufficient number alive to secure *Cinchona Condaminea* and some other species, and at once to test the possibility of this important culture in Java.

The Dutch government (especially the minister, M. Pahud, who took up the subject warmly), Professor Miquel, and M. Hasskarl—all, in short, who have co-operated to bring about this desirable object—have just cause to be proud of the credit which accrues to them for the introduction of cinchona culture into Java, and can honestly accept the praise which will be on all sides awarded them. We heartily congratulate Professor Miquel and M. Hasskarl on the decoration of the Order of the Lion bestowed on them by the King of the Netherlands, which affords a proof that their services have met with deserved acknowledgement in the highest quarters.

It were to be wished that nations having colonial possessions had followed the example of the Dutch. The French introduced, some years, since, cinchona plants in the mountain regions of Algeria; but nothing is yet announced of the result. To the English, the higher parts of the West Indies and the highlands of India offer a vast field for experiment. Professor Miquel has published, or is about to do so, a pamphlet on this new branch of cultivation, which cannot fail to direct the attention of the French and English governments to the subject, and perhaps may serve directly to secure to posterity one of the most important of remedies, and to clothe with an enviable renown the name of Miquel, as one of the benefactors of mankind.—*Pharm. Journ.* April 1st, 1856.

ON CATECHU AND ITS ACIDS.

By DR. C. NEUBAUER.

By Strecker's experiments on gallo-tannic acid and his proving its relation to gallic acid, the interest in the numerous bodies to which the name of tannin is applied has been created anew, and the author undertook these experiments in the hope to find

a relation, similar to the above, existing between catechu-tannic and catechuic acids. The author attempted to prepare the catechu-tannic acid by the process of Berzelius, to precipitate the aqueous tincture of catechu by sulphuric acid, decompose the precipitate by carbonate of lead, and evaporate the liquor in vacuo above oil of vitriol. But even a strong solution of catechu extracted by its own weight of cold water, yields but a slight precipitate with sulphuric acid, which remains suspended in the liquid, and does not settle after standing or moderately heating. A warm or hot prepared solution is instantly precipitated by sulphuric acid, caused, however, chiefly by the then dissolved catechuic acid, which I found instantly yields a yellow flocculent precipitate with it. Berzelius experimented on catechu-tannin in 1828, and used a warm prepared aqueous solution, thus obtaining also catechuic acid in solution, which was discovered in 1832 by Nees von Esenbeck. Having thus failed in preparing catechu tannic acid, the author tried the second method given by Berzelius, that of exhausting catechu in a percolator by ether. The yellowish solution did not separate into two strata, and was evaporated to dryness partly above oil of vitriol, another part in the water-bath. A porous brownish mass remained behind which, to separate it from a little ether, was dissolved in a little water, and, after Strecker's recommendation, slightly heated in the water-bath for a short time. The solution soon lost its smell of ether, but contained some green insoluble flocks, which were separated by filtration; the solution, on cooling over oil of vitriol, crystallized in fine white needles, which after filtration were recrystallized from warm water. The darker mother liquor precipitated gelatin, and did not yield any more crystals; these, from the following reactions and the elementary analysis, proved to be *catechuic acid*:

Heated with concentrated sulphuric acid it assumed a purple violet color, with solution of caustic soda, a brown color; the watery solution was instantly precipitated by acetate of lead (white;) sesquichloride of iron, at first a green color, afterwards a dirty green precipitate; gelatin was *not* precipitated, but sulphuric acid instantly, (yellowish.)

As these methods failed to yield catechu-tannic acid in some quantity, it might have been possible that this tannin, under the

influence of the air, was oxydized to catechuic acid. Several chemists believe in this behaviour, and Delffs asserts, that an aqueous solution of catechu-tannic acid, left to a spontaneous evaporation in a shallow vessel, fills with white crystals of catechuic acid, which take the place of the gallic acid on exposure of gallo-tannin; and that catechu contains catechin (catechuic acid) only as a product of decomposition of the tannin during the process of inspissation. To gain some light on this assertion, another quantity of catechu was exhausted with ether, which had been previously saturated with water. This solution had only a tinge of red; it was divided into three parts, one of which was evaporated in vacuo above sulphuric acid, the second at a moderate heat, and the third spontaneously in the open air; all left a resin-like, little colored mass, resembling gallo-tannic acid. The residues were all dissolved in very little water, the solutions heated to expel the ether, filtered and placed over sulphuric acid, where all on cooling stiffened to a mass of crystals, which under the microscope proved to be very fine needles, the former result not altered by the use of ether saturated with water, or by evaporation in vacuo. The crystals were purified by recrystallization from water, wrapped in paper and dried in the air. The mother liquors from the first crystallization necessarily must contain the tannin with some catechuic acid; it was left in an open vessel to the action of the atmosphere for six months, without its showing even traces of crystallization.

By the above methods, a mixture of catechuic and catechu-tannic acids, with a small quantity of colored matter (chlorophyl) is obtained, at it would seem that the catechuic acid is not formed by the action of the air on the tannin, but that it exists in the catechu, from which it is extracted by ether, as Nees von Esenbeck already stated, and Delffs observed the crystallization of catechuic acid only from a diluted solution. The author now prepared a larger quantity of catechuic acid, by exhausting catechu with watery ether, distilling off the ether in an atmosphere of carbonic acid, and towards the end in vacuo near oil of vitriol, dissolving by a moderate heat in water, filtering, recrystallizing twice, washing with cold water, and after pressing the white crystals, drying them at the ordinary temperature wrapped in much bibulous paper. The mother liquor from the

first crystallization was reddish brown, precipitated gelatin, and therefore contained the tannin. The other mother liquors had a yellowish color, which, after standing 24 hours, changed to a red, like that of the first; they also precipitate gelatin. The mother liquors were evaporated by means of a water-bath, when gradually they became turbid and the reaction with gelatin stronger; after evaporation to dryness, a shining, cracked, spongy mass remained, easily yielding a cinnamon-brown powder like that of catechu. Now it was only partly soluble in water; the brown filtered solution immediately precipitated gelatin; when treated in the percolator like catechu, it still yielded a considerable quantity of catechin; the ether had a slightly yellowish color; alcohol dissolved nearly all the residue.

Snow white catechuic acid was now dissolved in water, the solution had a yellowish tinge and did *not* precipitate a clear filtered solution of gelatin; it was boiled in an open dish for three hours, when it had become turbid and of a yellowish brown color, and after evaporation it dissolved with a dark color in water, leaving a reddish brown residue. The solution now *immediately precipitated a clear filtered solution of gelatin*, a fact observed already by Wackenroder.—(*Ann. d. Ch. and Pharm.* xxxvii., 376.)

This is a strong proof for the allegation that pure catechuic acid, under the influence of heat and the air, is converted into a substance which must be looked upon as a tannin. Büchner (*Geiger's Pharm. i.*, 864) says that catechuic acid, when heated until it becomes brown, changes to a tannic acid. But to entirely effect this change through the influence of heat and air is very difficult.

Catechuic acid was now prepared by the process recommended by Berzelius; catechu was first exhausted by cold, afterwards by boiling water, this last solution precipitated by sugar of lead as long as a colored precipitate was formed; the pale yellow filtrate was freed from the lead by hydrosulphuric acid, filtered while still hot, and yielded on cooling nearly white catechuic acid, which was recrystallized and washed with cold water.

The following are the results of the elementary analysis:

	I.			II.			III.			IV.	V.	VI.
C	17	102	52.58	52.46	52.78	= 17	102	61.08	60.95	61.32	61.20	61.77
H	12	12	6.18	6.09	6.08	= 9	9	5.39	5.29	5.25	5.17	5.10
O	10	80	41.24	41.45	41.14	= 7	56	33.53	33.76	33.43	33.63	33.13
	194			100.00	100.00		167	100.00	100.00	100.00	100.00	100.00

I. and II. is the acid prepared by ether air-dry; III., IV. the same dried at 100° C. (212° F.) until it *just* ceases to lose weight; V., VI. dried in the same way was prepared by water. The loss of the drying operation is 14.34 per cent.; 3HO are 13.92 per cent. When heated for a longer time the acid gradually assumes a yellow and brown color, and the loss increased to 15.85 per cent. Such a yellow acid on elementary analysis, gave results closely approaching those of Svanberg and Zwenger—C 62.62 H 5.24 O 32.14.

The lead salt was prepared by precipitating a warm solution with acetate of lead, filtering and washing quickly, pressing between bibulous paper and dried on the water-bath. It had a brown color and could not be obtained white; the results of the analysis approached as near as could be to the formula $C_{17}H_9O_7 + 2PbO$.

All the above experiments have been made with that variety of catechu called Bombay catechu.* For the following experiments Gambir catechu was used, and the catechuic acid prepared partly with ether, partly by Wackenroder's method, by macerating the catechu in three parts of cold water and boiling the residue several times with eight parts of water; the first crystallization is yellow, the others nearly white, and are to be recrystallized. The analytical results are the same as above.

White catechin was now boiled with diluted sulphuric acid (1HO, SO_3 to 24HO) for three or four hours. The cinnamon-colored precipitate was filtered, the filtrate saturated with carbonate of baryta, filtered and precipitated with acetate of lead; the filtrate was treated with hydrosulphuric acid to separate the lead in excess, evaporated in the water-bath, the brown residue dissolved in water, again treated with acetate of lead and hydrosulphuric acid, left a colorless crystalline residue, easily soluble in water, consisting chiefly of acetate of baryta, which was

* The author's description corresponds with that of *Pegu and Bengal catechu*, in Wood and Bache's Disp., 10th edit., 199, 200.

separated by sulphuric acid; the solution was tested for sugar, but not a trace was found. The above cinnamon-colored matter was insoluble in water, alcohol and ether, caustic potassa was colored slightly violet by it, concentrated sulphuric acid dissolved it, which solution was precipitated by water.

The behaviour of catechu-tannin to sulphuric acid was tried in a similar manner. Bombay catechu was exhausted with ether, the solution treated with water and evaporated to dryness; the residue dissolved in water and filtered from the crystallized catechuic acid. After long standing, the filtrate separated only some brown matter, but no catechuic acid; it was precipitated with and washed with sulphuric acid, and after pressing several hours, boiled with diluted sulphuric acid. The reaction and subsequent treatment was the same as above; 5 C. C. of Fehling's test separated only traces of suboxide of copper. Analysis showed the cinnamon-colored matter to consists of $C_{17}H_{10}O_{10}$; but there was no proof of its purity. The purest catechuic acid reduces suboxide of copper from Fehling's test liquid.

From the above the author comes to the following conclusions:

1. *Pure catechu-tannic acid* cannot be obtained by any of the above methods.
2. Catechuic acid bears not the same relation to catechu-tannin as gallic acid to gallo-tannin.
3. The different properties of the different kinds of catechu are probably the result of a different process of preparation.*
4. The catechuic acid of the different kinds of catechu is the same; composition $C_{17}H_{12}O_{10}$, of which 3HO are expelled at $100^{\circ}C.$ ($212^{\circ}F.$)
5. Catechuic acid is decomposed if exposed to a heat of $100^{\circ}C.$ for a long time.
6. Pure catechuic acid, decomposed by sulphuric acid, yields much of a brown insoluble substance, but no sugar.

* Nees von Esenbeck says, in Buchner's Repert. xliii., 352:

"As Bombay catechu contains though less catechin, we return to our opinion that, like gambir, it is obtained from *Uncaria gambir*. Its smaller amount of catechin, its larger of tannin and its browner color, may be due to the boiling of the branches and the wood of the *Uncaria* and the subsequent evaporation. It is also not impossible that the branches from which the gambir has been prepared, by decoction yield an extract resembling Bombay catechu."

7. Neither does catechu-tannic acid yield sugar, if treated in the same way.

8. A solution of pure catechuic acid is precipitated by sugar and reduces Fehling's test liquid.—(*Annalen d. Chemie u. Pharm.* xcvi., 337—361.)
MAISCH.

THE MUSK-DEER.

(From the Pharmaceutical Journal.)

This little persecuted animal would probably have been left undisturbed to pass a life of peace and quietness in its native forests, but for the celebrated perfume with which nature has provided it. Its skin being worthless from its small size, the flesh alone would hold out no inducement for the villagers to hunt it while larger game was more easily procurable, and its comparative insignificance would alike have protected it from the pursuit of the European sportsman. As the musk, however, is the most valuable of all, no animal is so universally sought after in every place it is known to inhabit. Musk is in demand in nearly every part of the world, yet little, I believe, is known of the nature and habits of the animal that produces it.

The musk-deer is rather more than three feet long, and stands two high at the shoulder; but they vary considerably in size, those found in thick shady woods being invariably larger than those on rocky open ground. The head is small, the ears long and erect. The male has a tusk depending from each upper jaw, which, in a full-grown animal is about three inches long, the thickness of a goose-quill; sharp pointed, and curving slightly backwards. The general color is a dark speckled brownish-grey, deepening to nearly black on the hind-quarters, where it is edged down the inside of the thighs with reddish-yellow. The throat, belly, and legs are of a lighter grey. Legs long and slender; toes long and pointed; the hind heels are long, and rest on the ground as well as the toes. The fur is composed of thick spiral hairs, not unlike miniature porcupine quills; they are very brittle, breaking with a slight pull, and so thickly set, that numbers may be pulled out without altering the outward appearance of the fur. The fur is much longer and thicker on the hind parts than the fore, and gives the animal the appearance

of being much larger in the hind-quarters than the shoulder. The tail, which is not seen unless the fur is parted, is an inch long, and about the thickness of a thumb; in females and young animals it is covered with hair, but in adult males is quite naked, except a slight tuft at the end; and often covered, as well as all the parts near it, with a yellowish waxy substance.

The musk, which is much better known than the deer itself, is only found in adult males; the females have none, neither has any portion of their bodies the slightest odor of musk. The dung of the males smells nearly as strong as musk, but, singularly enough, neither in the contents of the stomach, nor bladder, nor in any part of the body, is there any perceptible scent of musk. The pod, which is placed near the navel, and between the flesh and the skin, is composed of several layers of thin skin, in which the musk is confined, and has much the appearance of the craw or stomach of a partridge, or other small gallinaceous bird, when full of food. There is an orifice outwards through the skin, into which, by a slight pressure, the little finger will pass, but it has no connexion whatever with the body. It is probable that musk is at times discharged through this orifice, as the pod is often found not half full, and sometimes even nearly void. The musk itself is in grains, from the size of a small bullet to small shot, of irregular shape, but generally a dark reddish-brown color, but when taken out of the pod and kept for any length of time, becomes nearly black. In autumn and winter the grains are firm, hard, and nearly dry, but in summer they become damp and soft, probably from the green food the animals then eat. It is formed with the animal, as the pod of a young one, taken out of the womb, is plainly distinguishable, and indeed is much larger in proportion than in grown-up animals. For two years the contents of the pod remain a soft, milky substance, with a disagreeable smell. When it first becomes musk, there is not much more than the eighth of an ounce; as the animal grows, it increases in quantity; and in some individuals as much as two ounces are found. An ounce may be considered as the average from a full-grown animal; but as many of the deer are killed young, the pods in the market do not perhaps contain, on an average, more than half an ounce. Though not so strong, the musk of young animals has a much pleasanter smell than that of old ones; but

difference of food, climate, or situation, as far as my experience goes, does not at all affect the quality.

From the first high ridge above the plains, to the limits of forest on the snowy range, and for perhaps the whole length of the chain of the Himalayas, the musk-deer may be found upon every hill of an elevation above 8,000 feet, which is clothed with forest. On the lower ranges it is comparatively a rare animal, being confined to near the summits of the highest hills, as we approach the colder forests near the snow; but it is nowhere particularly numerous; and its retired and solitary habits make it appear still more rare than it really is. Exclusively a forest animal, it inhabits all kinds of forest indiscriminately, from the oaks of the lower hills to the stunted bushes near the limits of vegetation. If we may judge from their numbers, the preference seems to be given to the birch forests, where the underwood consists chiefly of the white rhododendron and juniper.

In many respects they are not unlike hares in habits and economy. Each individual selects some particular spot for its favorite retreat, about which it remains still and at rest throughout the day, leaving it in the evening to search for food, or to wander about, returning soon after daylight. They will occasionally rest for the day in any place where they may happen to be in the morning, but in general they return to near the same spot almost every day, making forms in different quarters of their retreat a little distance from each other, and visiting them in turn. Sometimes they will lie under the same tree or bush for weeks together. They make forms in the same manner as hares, levelling with their feet a spot large enough for the purpose if the ground is too sloping. They seldom, if ever, lie in the sun, even in the coldest weather, and their forms are always made where there is something to shelter them from its rays. Towards evening they begin to move, and during the night appear to wander about a good deal, from top to bottom of the hill, or from one side to another. The Puharries believe that they come to such places to play and dance with each other, and often set their snares along the edge of such a ledge or precipice, in preference to the forest.

If not walking leisurely and slowly along, the musk-deer always goes in bounds, all fours, leaving and alighting on the ground

together. When at full speed, these bounds are sometimes astonishing for so small an animal. On a gentle slope I have seen them clear a space of more than sixty feet at a single bound, for several successive leaps, and spring over bushes of considerable height at the same time. They are very sure-footed, and although a forest animal, in travelling over rocky and precipitous ground, have perhaps no equal. Where even the burrell is obliged to move slowly and carefully, the musk-deer bounds quickly and fearlessly; and although I have often driven them on to rocks which I thought it impossible they could cross, they have invariably found a way in some direction, and I never knew an instance of one missing its footing, or falling, unless wounded.

They eat but little compared to other ruminating animals, at least one would imagine so from the small quantity found in their stomachs, the contents of which are always in such a pulpy state, that it is impossible to tell what food they prefer. I have often shot them whilst feeding, and found in the mouth or throat various kinds of shrubs and grasses, and often the long white moss that hangs so luxuriantly from the trees in the higher forests. Roots also seem to form a portion of their food, as they scratch holes in the ground, like many of the hill pheasants. The Puharries believe that the males kill and eat snakes, and feed upon the leaves of the "kedar patta," a small and very fragrant smelling laurel, and that the musk is produced by this food. They may probably eat the leaf of this laurel, amongst other shrubs, but from the few occasions upon which I have seen this laurel stripped of any portion of its leaves, it does not appear to afford a very favorite repast. Their killing snakes is doubtless quite fabulous.

The young are born either in June or July, and almost every female brings forth yearly, and often twins. These are always deposited in separate places some distance from each other, the dam herself keeping apart from both, and only visiting to give them suck. Should a young one be caught, its bleating will sometimes bring the old one to the spot, but I never knew an instance of one being seen abroad with its dam, or of two young ones being seen together. Their solitary habits are innate, for if a fawn is taken young and suckled by a sheep or goat, it will not for some time associate with its foster-dam, but as soon as satisfied with sucking, seeks some spot for concealment. It is amusing

to see them suck, all the while they keep leaping up and crossing their fore legs rapidly over each other. They are rather difficult to rear, as many, soon after they are caught, go blind and die.

In most of the hill-states the musk-deer is considered as royal property. In some, the Rajahs keep men purposely to hunt it; and in Gurwhal a fine is imposed upon any Puharrie who is known to have sold a musk pod to a stranger—the Rajah receiving them in lieu of rent.

In some districts they are hunted down with dogs, but snaring is by far the most common method practised for their capture. A few are occasionally shot by the village shikaries when in pursuit of other animals, but the matchlock is seldom taken out purposely to hunt musk-deer, for a hill shikarie does not carry the match lighted, and the deer being generally come upon face to face, almost every one would get away before he could strike a light and apply it to the match. In snaring, a fence about three feet high, composed of bushes and branches of trees, is made in the forest, generally along some ridges, and often upwards of a mile in length. Openings for the deer to pass through are left every ten or fifteen yards, and in each a strong hempen snare is placed, tied to a long stick, the thick end of which is firmly fixed in the ground, and the smaller, to which the snare is fastened, bent forwards to the opening, so that the deer, when passing through, treads upon some small sticks which hold it down, the catch is set free, the stick springs back and tightens the snare round the animal's leg. Besides the musk-deer, numbers of the forest pheasants, moonals, corklass, and argus are caught in these snares; they are visited every third or fourth day, and it is seldom that the owners return without something or other. The polecats often find out the snares, and after once tasting the feast, if not destroyed soon, become a terrible annoyance, tracing the fence almost daily from end to end, and seizing on everything caught; they are often caught themselves, but immediately bite the snare in two and escape. Musk-deer are frequently lost to the snarers in this manner, for when one is eaten by the polecats the pod is torn to pieces, and the contents scattered on the ground. No animal swallows the musk, and when a deer has been killed and eaten by a leopard or other animal, if the ground be carefully examined, much of the musk

may be picked up. Insects and maggots also leave it untouched. I once found what I thought 'was a newly killed musk-deer, but on examination I discovered it was merely the skin and skeleton of one, which from its dry and withered state must have been dead some months; the flesh had been completely eaten away by maggots, but the musk-pod was entire.

The musk-pods which reach the market through the hands of the native hunters are generally enclosed in a portion of the skin of the animal, with the hair or fur left on it. When they have killed a musk-deer, they cut round the pod, and skin the whole of the belly. The pod comes off attached to the skin, which is then laid with its fleshy side on a flat stone previously heated in the fire, and thus dried without singeing the hair. The skin shrinks up from the heat into a small compass, and is then tied or stitched round the pod, and hung up in a dry place until quite hard. This is the general method of preparing them, but some put the pod into hot oil instead of laying it on a hot stone, but either method must deteriorate the quality of the musk, as it gets either completely baked or fried. It is best both in appearance and smell, if the pod is at once cut from the skin, and allowed to dry of itself.

The musk received from the Puharries is greatly adulterated, and pods are often made altogether counterfeit; and as they are generally sold without being cut open, it is scarcely possible to detect the imposture at the time. I have often seen pods offered for sale which were merely a piece of musk-deer skin filled with some substance, and tied up to resemble a musk-pod, with a little musk rubbed over to make it smell. These are easy to detect, from their being no navel on the skin, it being cut from any part of the body. But the musk is sometimes taken out of real pods, and its place supplied by some other substance, and these are difficult to detect even if cut open, as whatever is put in is made to resemble musk in appearance, and a little genuine added makes it smell nearly as strong. Some have only a portion of the musk taken out, and its place thus supplied; and others have all the musk left in, but something added to increase the weight. Even in the hills where it is produced, so little do the generality of the people know of musk, that I have often seen the Puharries about Gangoutrie sell to the pilgrims, to men from the lower hills, and

even to their own neighbors, small portions of what they called musk, but what was merely some substance resembling it, with a little genuine musk scattered over it. Of this stuff they would sell about a quarter of a tolah for a rupee, or about twenty shillings an ounce.

The substances commonly used for adulteration or to fill the counterfeit pods are, blood boiled, or baked on the fire, then dried, beaten to a powder, kneaded into a paste, and made into grains and coarse powder to resemble genuine musk; a piece of the liver or spleen prepared in the same manner; dried gall, and a particular part of the bark of the apricot-tree, pounded and kneaded as above. The dried paste from which common oil has been extracted, called "peena," is also used, and lumps of this are often, without further preparation, thrust into a pod through the orifice in the skin, to increase the weight. Sometimes no care is taken to give the material employed in filling a counterfeit pod even the appearance of musk. A gentleman once showed me a pod he had bought from a Puharrie at Missouri; on my telling him it was counterfeit, he cut it open, and found it filled with hookah tobacco.—*Pharm. Journ.*, from *Shooting in the Himalayas: a Journal of Sporting Adventures and Travel in Chinese Tartary, Ludac, Thibet, Cashmere, &c.* By Col. Fred. Markham, C. B., 32d Regiment.

ON ANTIMONIAL VERMILION.

By E. MATHIEU-PLESSY.

The author has invented a process which furnishes antimonial vermilion of a beautiful color, and which is sufficiently simple to be employed in its preparation on a large scale.

Hyposulphite of soda is best prepared by the action of sulphur upon sulphite of soda; it is not usually allowed to crystallize. The sulphite of soda must be in the neutral state to avoid the action of the sulphurous acid upon the hyposulphite. The sulphite of soda is most simply and cheaply prepared in the following manner, recommended by Camille Köchlin. In the upper part of a vessel, the bottom of which is broken out, a sieve containing large crystals of carbonate of soda is fixed. Into the

lower part of the vessel projects a furnace-pipe bent at right angles, which is attached to a small clay furnace. Into this furnace sulphur is thrown by little and little, and burns into sulphurous acid, which passes through the tube into the vessel, and there acts upon the carbonate of soda. The combustion of the sulphur may be regulated as occasion requires through the door of the furnace; the draught is quite sufficient, and in the course of three or four days the crystals of carbonate of soda are acted upon to a considerable depth. The very friable sulphite of soda may be readily separated from the unaltered nucleus if any remains, and the latter may then be put back into the sieve. The sulphite of soda is dissolved in water so as to produce a solution of 25° B., and this is saturated whilst hot with crystallized carbonate of soda. When effervescence no longer occurs on the addition of this salt (which is the best criterion, as litmus-paper gives no satisfactory indications), or rather when the dilute sulphite furnishes a slight effervescence of carbonic acid on the addition of muriatic acid, flowers of sulphur are added, and the mixture is heated in an earthen vessel for three hours on the water-bath, stirring, and replacing the water that evaporates. When the fluid is cool, it is filtered and diluted until it shows 25° B.

Perchloride of antimony is prepared by heating powdered black sulphuret of antimony with commercial muriatic acid. When the evolution of sulphuretted hydrogen begins to diminish at a gentle heat, the mixture is boiled for a few minutes. On cooling, the clear liquid is decanted. To avoid inconvenience from the sulphuretted hydrogen gas evolved during the solution of the sulphuret of antimony, it may either be passed into a solution of soda, or allowed to pass through a tube drawn out to a point at the extremity, close to which the flame of a spirit-lamp is placed; by this the sulphuretted hydrogen is burnt, even when it is mixed with much aqueous vapor. The solution of chloride of antimony obtained is diluted with water to 25° B.

When the solutions of hyposulphite of soda and chloride of antimony are thus prepared, the antimonial vermilion is prepared in the following manner:—4 litres of solution of chloride of antimony and 6 litres of water are poured into a stoneware basin, and after these 10 litres of the solution of hyposulphite of soda.

The precipitate which is produced by the water is rapidly dissolved by the hyposulphite of soda in the cold. The basin is now placed in a water-bath which is heated to boiling; in this the temperature of the mixture gradually rises. Towards 86°F . the precipitate begins to form; it is at first orange-yellow, but gradually becomes darker. The temperature is allowed to rise to 131°F ., when the basin is removed from the water-bath, and the precipitate is allowed to settle, which takes place rapidly. The fluid is separated from the precipitate by decantation; the precipitate is washed first with water containing one-fifteenth of muriatic acid, and afterwards with common water, then collected on a filter and dried. In the moist state the antimonial vermilion has a shining red color, but in drying it loses a little of its lustre. It was also produced in the cold, but the process described is more certain and furnishes a finer color.

The author has analyzed the antimonial vermilion thus prepared, and at the same time examined the amount of water in the ordinary orange-red sulphuret of antimony (precipitated by sulphuretted hydrogen). 0.668 grm. of the latter lost 0.038 grm. in weight when heated to 392°F .; 0.808 grm. of antimonial vermilion showed a loss of 0.0098 grm. when heated to the same temperature. The latter might be attributed entirely to hygroscopic water, and the antimonial vermilion may therefore contain no chemically-combined water. The loss of weight which the orange-red sulphuret of antimony undergoes shows, on the contrary, that this contains water chemically combined, and this loss of weight gives it the composition $\text{SbS}^3 + \text{HO}$. The further analysis of the antimonial vermilion was effected by treating a weighed quantity of it with nitromuriatic acid containing an excess of nitric acid. A portion of sulphur remained undissolved, which, after tartaric acid had been mixed with the fluid, and the latter had been diluted with water, was separated, dried, and weighed. The fluid contained the remainder of the sulphur in the form of sulphuric acid, which was determined by precipitation with chloride of barium. The antimony was merely determined from the loss. The result of the analysis was, that the antimonial vermilion consists of 1.1 per cent. of water, 26.7 per cent. of sulphur, and 72.2 per cent. of antimony. As the water is to

be regarded as non-essential, it appears that the compound consists entirely of sulphur and antimony.—*Chem. Gaz.*, March 15, 1856, from *Polytechn. Centralbl.*, 1855, p. 1451.

PREPARATION OF THE DEUTOXIDE OF LEAD.

In the *Annalen d. Chemie und Pharmacie*, xiv. 333, Professor Woehler recommends the following process for preparing this deutoxide:

A solution of acetate of lead is precipitated by carbonate of soda and a current of chlorine passed through the mass until all the carbonate of lead has been converted into the dark brown deutoxide, which is then to be thrown on a filter and washed. By operating in this way *all* the lead is obtained as deutoxide, free from chloride; but chloride of sodium is formed, and carbonic and acetic acids set free. The two salts may be taken in the proportion of their weights of equivalents, but it is better to take the carbonate of soda in slight excess, in order to more effectually guard against the formation of chloride of lead. Four parts of acetate of lead gives $2\frac{1}{2}$ p. of deutoxide, while only $1\frac{1}{2}$ parts will be obtained from 4 p. of minimum. This deutoxide instantly becomes white in sulphurous acid gas.

Dr. A. Overbeck (*Archiv d. Pharm.* 1856, 5) recommends the following method as simple and economical:

A concentrated solution of 329.6 parts of red cyanuret of potassium and iron is boiled with 47.2 p. of potassa and 112 p. of protoxide of lead in its hydrated state, until the solution has assumed the well known color of (yellow) ferrocyanuret of potassium; the deutoxide is filtered, washed and dried, and the filtrate and washings evaporated to obtain the ferrocyanuret of potassium; the yield will be 368.8 p. of the latter, and 120 p. of the deutoxide. The process may be explained as follows:— $\text{KO} + \text{PbO} + \text{K}_3\text{Fe}_2\text{Cy}_6 = \text{PbO}_2 + 2(\text{K}_2\text{FeCy}_3)$. This deutoxide is readily heated to redness in sulphurous acid gas, and afterwards forms a purely white mass.

A deutoxide prepared by Woehler's process was found by Muck to contain 1.54 per cent. chlorine, equivalent to 6.03 p. c. chloride of lead; he also could not obtain Crum's test for manganese with this deutoxide (*Wittstein's Vierteljahrsschr.* iv.

546). These statements induced Dr. A. Geuther (*Annalen d. Chem. and Pharm.* 1855, Dec. 382) to examine it, and he found that the deutoxide is obtained pure whether the carbonate of soda used be pure or contain chloride of sodium; in the latter case the acetate of lead must gradually, and under good stirring, be poured into the carbonate of soda. In both cases a deutoxide was obtained wholly soluble in nitric acid under the addition of a little alcohol, and this solution did not show a trace of chlorine to be present when treated with nitrate of silver. Also, Crum's test was obtained by heating some deutoxide with nitric acid, and adding a few drops of some solution of protoxide of manganese previously diluted until sulphuret of ammonium did not render it turbid.

MAISCH.

ON THE CHARACTERS OF RED WINES ADULTERATED WITH ALUM, AND THEIR APPLICATION TO THE DETECTION OF SMALL QUANTITIES OF THAT SALT INTRODUCED INTO WINE.

By J. L. LASSAIGNE.

The author has found that the aluminous salts, when dissolved in red wines, are partially decomposed with more or less rapidity, according to the temperature at which the operation is carried on. The result of this reaction is the precipitation of a colored compound, formed by the union of the alumina with a portion of the coloring matter of the wine; and this compound, which varies slightly in color according to the kind of wine, is a true lake, such as is produced by alumina with most of the organic coloring principles.

When a red wine is boiled for a few minutes with a very small addition of alum, it gradually becomes turbid, and furnishes a flocculent precipitate, which collects at the bottom of the vessel when the wine is allowed to cool and stand; it forms a completely insoluble lake. This deposit, which may easily be separated by decantation and filtration, presents reactions characteristic of the color derived from the wine itself; when calcined in contact with the air in a platinum crucible, it leaves a tolerably abundant, white, pulverulent residue, presenting all the characters of anhydrous alumina.

Pure red wines, without any addition of aluminous salt, are

not rendered turbid even by long boiling ; and besides, the deposit which they may sometimes furnish under these circumstances, would not present the composition above indicated. The author adds, that by this simple process, potash or ammoniacal alum may be quickly detected in wines containing one one-thousandth, one two-thousandths, or even one three-thousandths of these salts.—*Chem. Gaz.*, April 1, from *Comptes Rendus*, Feb. 25, 1856, p. 410.

ON THE OXYPHENIC ACID OF WOOD-VINEGAR.

By MAX BUCHNER.

Pettenkofer found that wood-vinegar contains an acid, which from its properties might be taken for pyrogallic acid. At his instigation A. Pauli investigated this body, and found that it was distinct from pyrogallic acid. The author has continued this investigation, and found that it is identical with phenic acid, pyromoritanic acid of Wagner, and pyrocatechine of Reinsch and Zwenger.

Wood-vinegar is evaporated to the consistence of a syrup, and the residue agitated with a saturated solution of chloride of sodium, in order to separate the tarry constituents. The benzoic acid remains in the solution, and is extracted therefrom by ether, which is shaken with the solution. The ethereal stratum is drawn off, and the ether got rid of by distillation.

The residue is now further distilled, whilst a current of carbonic acid is passed through the apparatus. Various distillates are obtained. The first still contains some ether, together with acetic acid ; it is nearly colorless. The second is a reddish-yellow, rather thinly fluid-oil ; it contains the principal part of the required acid. The third is a brown oil, in which there is still some acid, which however does not crystallize.

The second distillate, collected until the brown oil begins to pass over, sets into a crystalline jelly, which is purified. The crude wood-vinegar contains from 0.1 to 0.2 per cent. of this acid. Its amount is determined by adding potash to the wood-vinegar, and allowing oxygen to be absorbed by the fluid. 10 milligrams. of oxyphenic acid absorb 3.7 cub. centims. of oxygen at 32° F., and with a barometric pressure of 760 millims.

The acid may also be obtained directly from the wood-vinegar without previous evaporation by agitation with ether. The mixture is then left to separate, the ether is distilled off, and the residue agitated with a saturated solution of chloride of sodium. The oil separates completely from this solution, and the acid is afterwards extracted from the solution by repeated agitation with ether. If the ether be then distilled off, a fluid remains, from which the acid separates in crystals. The acid may also be obtained from the residue by sublimation in a current of carbonic acid.

The acid thus produced crystallizes in very lustrous laminae, belonging to the rhombic system; it fuses at $231^{\circ}\cdot 8$ F., and volatilizes even at its melting-point; the vapor provokes sneezing. It has exactly the reactions of oxyphenic acid. Analyses:—

	I.	II.		
C	68.26	68.39	12	65.45
H	5.91	5.96	6	5.46
O	25.47	25.65	4	29.09

The analyses are,—I., of acid fused in a porcelain tray; II., of acid sublimed and fused.

The author explains the excess of carbon and hydrogen by the adhesion of a little hydrocarbon to the acid. The lead-salt A, dried at 212° F., contained 70.08 per cent. of oxide of lead; the salt B, dried at 239° F., contained 71.76 per cent. of oxide of lead. The analyses of these salts gave—

	A.		B.			
C	22.60	22.23	22.13	22.78	12	22.78
H	1.58	1.48	1.39	1.27	4	1.27
O	5.74	6.21	4.72	5.06	2	5.06
PbO	70.08	70.08	71.76	70.89	2	70.89

The author considers it not improbable that this acid may be produced from carbolic acid during the dry distillation of wood. It always accompanies the products of the dry distillation of wood, but does not occur in coal-tar.—*Chem. Gaz.*, March 15, from *Leibig's Annalen*, xvi. p. 186.

ON SOME REACTIONS OF OXALIC ACID.

BY J. W. SLATER.

The decomposition of certain chlorides and nitrates by oxalic acid has been lately studied. It decomposes in like manner the fluoride of calcium very readily, hydrofluoric acid being evolved as if the fluor spar were treated with strong sulphuric acid.

Oxalic acid decomposes the phosphates of iron, silver, zinc and copper, and the arseniates of iron, silver and copper. In all these cases the arsenic or phosphoric acid is set free, with formation of the corresponding oxalate.

It dissolves the sulphurets of iron and manganese, but not those of zinc, cadmium, uranium, cobalt, mercury or copper. This reaction may be employed for the quantitative separation of iron and manganese from zinc and cobalt.

Oxalic acid decomposes most of the chromates, though in no case is chromic acid liberated. The chromate of zinc is first dissolved, forming a yellow solution. On standing, or more rapidly on the application of heat, the solution becomes turbid, oxalate of zinc is deposited as a white powder, whilst oxalate of chrome remains in solution. The chromates of bismuth, baryta, mercury and lead are all immediately decomposed by oxalic acid without previous solution. The chromate of lead is scarcely affected if it has been strongly dried.

Chloride of antimony is decomposed by strong solution of oxalic acid. The precipitate is free from chlorine. It is only very slowly decomposed by boiling water. Glass in fine powder is readily attacked by oxalic acid. Oxalate of lime and oxalates of alkali are produced, and silica is set free. Silica does not appear to dissolve in oxalic acid under any circumstances. A variety of minerals are more or less rapidly acted on by oxalic acid, yielding products that still require examination. The influence of the lichens containing oxalic acid is probably very important in effecting the disintegration and decomposition of rocks, this acid being, as we know, capable of attacking almost every class of saline compounds.—*London Chem. Gaz.*

ON THE COMPOSITION OF THE MUSCLES OF ANIMALS.

By MM. VALENCIENNES and FREMY.

As in their investigation of the eggs of animals, the authors have examined the muscular fibre of creatures of different orders. The fibres were freed as far as possible, by anatomical means, from aponeurotic fibres, nerves, blood vessels, fat, &c.

In the analysis of the muscles of the vertebrate animals, they found the principal constituent to be *creatine*. Besides this they contained inosinic acid and creatinine. Here, therefore, they effected nothing more than a confirmation of the researches of Chevreul and Liebig. Creatinine, however, appears to be more generally diffused in the animal kingdom than was supposed, for it occurred in the muscles of all the Vertebrata; sometimes it was met with in a free state, when it was recognizable by its alkaline reaction, and sometimes it was combined with phosphoric acid.

The body which communicates to the muscles their acid reaction is, in some cases at all events, lactic acid; but the strong acid reaction of the muscles is usually caused by the presence of acid phosphate of potash, $\text{KO}, 2\text{HO}, \text{PO}^5$. This salt is obtained by extracting the muscles with weak alcohol, and evaporating the solution to the consistence of a syrup, when the salt crystallizes.

The quantity of this salt in the muscles appears to stand in connection with the formation of bone. It was always found in considerable quantities in those animals which possess greatly developed bones, but in very small amount in the Articulata and Mollusca. It is easy to see that this salt may be of importance in the formation of bone, as direct experiments showed that this solution converts carbonate of lime into phosphate.

This phosphate also appears to be not without influence on the production of a phosphuretted fat which is contained in the muscles. The muscles of vertebrate animals contain a considerable amount of fat, which consists of variable quantities of oleine, margarine and stearine. Together with these neutral fats another occurs, which in its general properties is distinct from the neutral fats. It is obtained by extracting the muscles with weak alcohol, which does not dissolve the ordinary fats. If

this alcoholic solution be evaporated, the residue is a sticky mass of an amber-yellow color, which is completely soluble in water. When treated with sulphuric acid, it is decomposed in the manner of a soap; the result is sulphate of soda and an acid which is heavier than water. This acid contains phosphorus and nitrogen, and has the same composition as Fremy's oleophosphoric acid. The phosphuretted fat of the muscles is therefore the same as that of the brain, and it is diffused in the most various parts of the organism; it diminishes in quantity with age, and varies according to the species of animal.

Thus, the fishes with soft white flesh, such as the carps, plaice and flounder, contain but little of it; whilst those with a compact flesh, with a distinct taste, which are generally difficult of digestion, such as the herring, mackerel, trout and especially the salmon, contain it in considerable quantity. It is to this phosphuretted fat that these fishes are indebted for their characteristic flavor.

In the examination of the muscles of these fishes, the authors were led to investigate the coloring matter of the muscles, which is so remarkable in the salmon, the salmon-trout, and some other species. This coloration stands in determinate relation to the reproduction, for the salmon has red flesh throughout the year, but it becomes paler at the spawning season; and this change of color is still more distinct in the trouts, the flesh of which becomes perfectly white at that period.

As the fishes do not all spawn at the same time, and the females have a stronger salmon color and retain it longer than the males, it follows that we may obtain from the same water trouts with white or salmon colored flesh. From this it follows also, that the salmon trout is not a hybrid between the salmon and the trout, which moreover cannot well be the case, as the salmon spawns in July, rarely even in August, and the trout in December.

The coloring matter of the flesh of the salmon has already been mentioned by Davy in his "Salmonia." He states that the muscles of the salmon may be deprived of their color by ether. The authors have found that this coloring matter consists of a fat, which possesses the properties of a weak acid, and is dissolved in a neutral fat. The authors call this body

Salmonic Acid.—It is obtained from the expressed oil of the muscles of the salmon, by shaking it with alcohol containing a little ammonia. This fluid readily takes up the coloring matter, the ammonia is then neutralized by an acid, the ammoniacal salt is allowed to separate, and the coloring matter is obtained in the form of a sticky red acid, which possesses all the properties of a fatty acid. The salmon-trout furnishes the same acid as the salmon.

It occurs in considerable quantity, mixed with oleophosphoric acid, in the spawn of the salmon, which accounts to a certain extent for the loss of flavor in the flesh of the salmon during the spawning season. Different species contain different quantities of salmonic acid; thus the *Salmo hamatus*, Val., contains less than the *Salmo Salmo*.

The muscles of the Crustacea appear to be more simple in their composition than those of the Mammalia (Vertebrata?) the phosphate of potash is generally deficient, but on the other hand, the oleophosphoric acid is present in as great proportion as in the muscles of fishes. Creatine and creatinine were also obtained from several species.

Muscles of the Mollusca.—With these also the authors took great care to obtain them free from all other tissues and products of secretion. They examined the fibres of Cephalopoda (*Sepiæ*) and Acephala.

The composition of these fibres is much less complex than in the Vertebrata. They contain only inconsiderable quantities of acid phosphate of potash, oleophosphoric acid, creatine and creatinine. Instead of the latter, it is remarkable that they found taurine. They detected this body, not only by its properties, but also by its elementary analysis. Senarmont determined the crystalline form of this taurine, and found it to be identical with that of taurine from the bile. The authors obtained taurine both from the muscles of *Sepiæ* and of the oyster. This occurrence of taurine is very remarkable, and certainly proves that it is not a product peculiar to the bile.—*London Chem. Gaz.*, from *Journ. de Pharm. et de Chim.*

A NEW METHOD FOR DETECTING THE PRESENCE OF SULPHUR IN HOPS.

By DR. RUD. WAGNER.

The question, whether or not a sample of hops has been treated with sulphurous acid during the drying, is one of more than ordinary difficulty to decide.

The brewers of Bavaria pour water on a handful of the hops, and place in the mixture a silver spoon, and imagine that if the hops have been sulphured, black stains of sulphuret of silver will be produced on the spoon.

This test is a very uncertain one, and scarcely succeeds once in ten times. A comparatively very large amount of sulphurous acid is required in order to produce a stain of sulphuret on the surface of the silver, in which case it can be detected better by the smell than by any chemical test. Now when it is considered that commonly 1 lb. of sulphur is used to 2 cwt. of hops, that fully a fourth of this quantity remains unburnt, that more than half of the sulphurous acid escapes into the atmosphere, owing to the method employed, it will be seen how small a proportion of sulphurous acid is efficaciously applied.

This small proportion of sulphurous acid can only be discovered by the silver-test when the hops have been sulphured a short time previous to its application (eight to fourteen days;) and in this case an observable stain of sulphuret only appears when the mixture of hops and water has been left to itself at a moderate temperature for several days, when, in consequence of the fermentation which takes place, the sulphurous acid is reduced to sulphur. To an opinion recently put forth, that metallic silver was capable, in the absence of organic matter, of converting sulphurous acid into sulphuric acid and sulphur, the author can by no means assent, as he has convinced himself by experiment, that metallic silver may remain in contact with a very dilute watery solution of sulphurous acid for a fortnight, without the smallest stain of sulphuret appearing on its surface.

An examination with a magnifying lens, in order to ascertain from the form and color of the lupulin, whether the hops have been sulphured, is no longer possible in the present condition of the hop trade of Bavaria, where the hops are not treated with

sulphur for any dishonest purpose, as seems to be the opinion in North Germany, but merely to improve their keeping qualities, and render them more fit for exportation.

The author has tried the method proposed by Dr. Heidenreich, of Ansbach upwards of three years ago, and employed it in numerous instances in judicial proceedings. According to this, twenty or thirty of the cones of the hop are placed in a flask with zinc and muriatic acid, and the hydrogen evolved passed through a solution of acetate of lead; if the hops contained sulphurous acid, sulphuretted hydrogen is produced, and causes a dark brown precipitate of sulphuret of lead.

This process is satisfactory when the hops have been sulphured within a few (three to four) weeks, but is not sufficiently delicate when the object is to detect a minute trace of sulphur.

The author has effected an improvement on Heidenreich's method. It now affords us a means of detecting sulphurous acid, not only in hops, but also in all other substances, such as wines, bleached silk, &c., even when it exists in such minute quantity as to escape detection by any other method.

The test is founded on the fact, that a solution of nitroprusside of sodium is colored a magnificent purple by the smallest trace of an alkaline sulphuret, such as sulphuret of potassium or ammonium.

In the employment of the test, a solution of nitroprusside of sodium, so dilute as to appear of a very light brown color, is placed in a beaker, and a few drops of solution of caustic potash added. The process is now conducted as in Heidenreich's method. The hops under examination are placed in a flask with a piece of sheet zinc, diluted muriatic acid poured over them, and the gas conducted into the solution of the nitroprusside. If the gas contain but a minimum of sulphuretted hydrogen, the first bubble causes a violet cloud in the solution; after passing the gas for a short time, it assumes the magnificent color of the solution of permanganate of potash. The vapor of muriatic acid passing over with the gas, does not affect the reaction unless it be continued too long. It will be readily understood that the gas should not be washed; at most it should be filtered through cotton-wool.

In hops which have been sulphured, it is impossible to detect the sulphur after a few months.

This test for sulphurous acid is not only one of the most delicate in the whole range of analytical chemistry; it is also one of the simplest and most beautiful.—*London Chem. Gaz.*, from *Kunst. und Gewerbeblatt für Bayern*.

ON THE PREPARATION OF SUCCINIC ACID FROM MALATE OF LIME.

By E. J. KOHL.

In the preparation of succinic acid from malate of lime, which is obtained from the juice of the berries of the mountain ash, succinate of lime is not always obtained, but sometimes butyrate and sometime lactate of lime, with a larger or smaller quantity of succinic acid. The author has ascertained the conditions under which a favorable result may be obtained in the formation of this acid in the fermentation of malate of lime.

1. *Preparation of the Malate of Lime.*—The malic acid is obtained from the berries at the period when they begin to turn red; at this time they furnish the largest quantity of acid. The expressed juice of the berries is evaporated to half its volume, and then perfectly clarified by straining through a pointed bag, which is best made of flannel. The dark red fluid thus obtained is heated to boiling, and nearly saturated with milk of lime, purified by straining through a sieve: the point of saturation is indicated by the dark reddish-brown color of the fluid. If too much lime be added, the fluid appears blackish-green; but this error may be corrected by a further addition of juice, for which reason it is as well to keep some of it back. The boiling is continued until the fluid is almost of the thickness of a syrup, when the malate of lime separates in a crystalline form; this is taken out with a perforated spoon, and put into a vessel in which a stage can be fixed at a greater or less elevation, according to the quantity of the malate of lime, to allow the fluid to drain away. The salt is washed in this vessel by mixing it with water and allowing it to settle, until the fluid, which at first is reddish-brown, runs away almost limpid. This is necessary for the success of the operation, and the loss thus occasioned is of no con-

sequence, as it only amounts to 0.67 per cent. The salt thus obtained is pressed, and the quantity of fluid still contained in it is determined, so as afterwards to calculate its dry weight. If the berries employed be too ripe, only a very small quantity is obtained, and this of indifferent quality.

2. *The Ferment.*—The best ferment was always putrid caseine, but it is not a matter of indifference at what stage of putridity the caseine is. Caseine which had been pressed into a pot and kept for one and a half to two years covered with several layers of blotting-paper, gave the best results.

3. *The Fermentation.*—The washed malate of lime is stirred up with three times its weight of cold or warm water of about 77° to 86° F., in large stone pots or tubs, and to each pound of the dry lime salt, 1 oz. of caseine of the above properties, triturated with water, is added; the vessel is then placed where it will be exposed to a temperature varying day and night between 51° and 72° F. The evolution of carbonic acid very soon indicates the commencement of fermentation, which takes place slowly. If this goes on in the way required for the formation of succinic acid, an excessively disagreeable odor of rotten cheese is evolved. If this disappears at once, we may conclude that other products are being formed; if after once disappearing it recommences, we may be certain of the formation of succinate of lime, although in this case a loss will take place, which, however, is often very inconsiderable.

In from eight to fourteen days, or sometimes longer, during which the mixture must always be stirred every day, the fermentation is complete, and the succinate of lime formed is deposited partly in fine needles, and partly united into crusts. When once the formation of succinate of lime is completed, the mixture remains without formation of any other products except those already mentioned, which are produced in small quantities even for years. The succinate of lime thus obtained is repeatedly washed in water, and pressed; a sample is then dried upon the water-bath, so as to determine the dry weight of the whole. If it be in crusts of too large size, they must previously be broken up. This operation stands in direct relation to the

4. *Preparation of the Succinic Acid.*—For the decomposition of the succinate of lime, 50 parts of sulphuric acid are employed

to 100 parts of salt. The crude succinate of lime is stirred up with water to form a thick paste, and the necessary quantity of hydrated sulphuric acid is added by degrees, with constant stirring, during which there is of course a great evolution of heat. When the effervescence caused by the intermixture of carbonate of lime has ceased, the paste is diluted with three or four times as much water as the expected result in succinate of lime employed, which furnishes nearly one-third of its weight of acid; and the whole is digested until the completion of the decomposition, which is indicated by the formation of a homogeneous mass. The brown solution of the acid is filtered away from the sulphate of lime through a pointed bag; the sulphate of lime is freed as much as possible from adherent acid by repeated diffusion in water and filtering, and then the fluid is evaporated to dryness. If a slight excess of sulphuric acid be not already present, this addition is made, and the mixture is put into a wide-necked retort; the neck of the retort must be short, with a loosely-fitting receiver, and the body of the retort surrounded with sand to a considerable height. When the acid melts, water is first condensed into the receiver; but as the acid reaches the boiling-point, it passes over in oleaginous drops, which solidify both in the neck of the retort and in the receiver. If the acid passing over, which is to a certain extent anhydrous, comes in contact with the water previously condensed in the receiver, so great an evolution of heat is produced that the mass appears to boil; it must then be cooled. The more carefully the fire is regulated, the whiter is the product. A second receiver may be substituted as soon as the acid begins to pass over. The sublimation is continued until at a high temperature white vapors begin to appear in the retort. The carbonaceous residue may easily be removed from the retort, so that the latter may be employed again for many operations. The receiver, however, is generally destroyed, as the acid contained in it cannot be got out without breaking it to pieces, unless it be desired to have it crystallized, when water may be employed. The white or yellowish acid thus obtained, broken into fragments, is heated in a suitable vessel on the water or sand-bath, until all the sulphurous acid which is produced during distillation, as well as the adherent moisture, is entirely dispelled. If it be desired to prepare the medicinal, and not a chemically

pure acid, 1 drm. of *oleum succini rectificatum* is added to every pound of the dry acid, mixed with it most intimately by trituration, and again sublimed. The product of the sublimation, or the mixture of oil and acid, is dissolved in 2 parts of boiling water, filtered, and set to crystallize. To procure chemically pure acid, the whitest is selected, and treated in the known manner.

From the preceding statements it appears that the officinal acid may also be obtained directly by the simple sublimation of the crude acid impregnated with the oil of amber.

Pure succinic acid is obtained from the crude product in crystals similar to those of sulphate of quinine. The retort is immersed in the sand not deeper than it is filled with the mixture of succinic acid with a little sulphuric acid. This must not fill more than one-fourth of the retort. As soon as the dome and the entrance of the neck of the retort are covered with beautiful dendritic crystals, which, however, must reach down nearly to the middle of the retort, it is allowed to cool slowly. The whole belly of the retort is then found filled with this beautiful preparation down to the solidified unsublimed portion. The retort is destroyed, as the lower portion, containing the fused crude acid, must be broken away in order to procure the crystalline acid, which, when spread upon bibulous paper, is heated to expel the sulphurous acid and moisture.

The process, according to the author's experience, is the shortest and most certain. The purification of the crude acid by repeated crystallization, and decoloration by pure animal charcoal, takes up a great deal of time and causes a considerable loss; in the first case the crystals always become covered with a somewhat resinous coat, which spoils their appearance, and can scarcely be got rid of without the employment of animal charcoal.

5. *Metamorphoses of Malate of Lime.*—It is of great importance that all sugar should be washed out of the malate of lime before it is exposed to fermentation. If the salt contain sugar, it produces first of all lactate of lime, and, according to the duration of the process, and the mode in which it is carried on, metacetate, butyrate, and acetate of lime.

In the complete conversion of malate into succinate of lime, the only subordinate products are carbonate and acetate of lime.

That an incomplete change with formation of lactic acid, and secondarily of bodies produced from this, is caused by the presence of sugar in the malate of lime, is proved by the circumstance, that when grape-sugar is added to pure malate of lime before the fermentation, the result is lactate of lime, and when the action of the ferment is continued longer, it is principally metacetonate of lime, &c. According to this, it is in the power of the experimenter to produce one or other of these bodies at pleasure. The extremely bad odor of the most putrid caseine already mentioned, soon gives place to that of lactic acid when sugar is present, and is not again perceptible if the latter be in sufficient quantity. The base with which the lactic acid first combines is the ammonia produced from the caseine.

The caseine, which serves as a ferment in this process, is prepared as above described. It is frequently kneaded, until at last it forms a brownish, perfectly homogeneous mass, of not the most pleasant odor. This mass exhales considerable quantities of ammonia. If caseine in the above condition be mixed with sulphuric acid, a slight odor of butyric and acetic acids is evolved on the application of heat; whilst that of metacetic acid is very distinctly perceptible. It is clear that these acids are combined with ammonia in the putrid caseine, as solution of potash, especially when hot, sets free a considerable quantity of ammonia. When the caseine has acquired the above properties, and the fermentation of the malate of lime has been effected under the above conditions, the desired product, succinate of lime, is obtained, together with the collateral products already mentioned. The metacetic, butyric, and acetic acids present in the caseine, combined with ammonia, are evidently the last members of the series of lactic acid formed from sugar of milk. The decomposition of the former into butyric and acetic acids by the further action of the ferment is extremely probable; and the author proposes to investigate these matters more closely.

Quite a different result is obtained in the fermentation of malate of lime when fresh caseine is employed. This still contains sugar of milk, and the lactic acid formed from it. Half-way between the fresh and putrid caseine stands that which is employed in domestic economy in the manufacture of cheese. This combines the properties of both. According to the degree

to which putrefaction has gone, more or less succinic acid, or of the other products, is obtained by its action upon malate of lime. —*Chem. Gaz.*, March 15, from *Archiv der Pharm.*, cxxxiv. p. 257.

ON THE EMPLOYMENT OF SULPHURET OF CARBON FOR INDUSTRIAL PURPOSES.

By E. DEISS.

The author commences by stating, that in 1840, the price of sulphuret of carbon was as high as from 50 to 60 francs the kilogramme, but that soon afterwards he reduced its price so greatly that in 1848 he sold it at 8 francs the kilogramme, for the purpose of vulcanizing india-rubber. At present, with an apparatus composed of three retorts, he is able to manufacture the immense quantity of 500 kilogrammes of sulphuret of carbon in twenty-four hours; although scarcely a year ago, with the same furnace, the same retorts, and the same amount of fuel, he could only produce 150 kilogrms. in the same time. The product now costs him only 50 centimes the kilogramme, and he has no doubt that, by operating on a larger scale, it might soon be sold at 40 francs per 100 kilogrms. As, however, this substance has at present only a very limited employment in the vulcanization of india-rubber, the author having a large quantity on his hands, naturally desired to find some other purpose to which it might be applied; and considers that he has discovered one of the greatest importance, namely, the extraction of fatty matters.

He states that Paris daily produces 30,000 kilogrms. of bones, which are collected by the *chiffonniers*, and carried to the manufactories of ivory-black and gelatine. Here they are sorted, some being devoted to the production of ivory-black, others of gelatine, whilst some are sold to the workers in bone. The greater part of them (25,000 kilogrms. daily) are employed in the manufacture of ivory-black; but these undergo a preliminary treatment for the extraction of their fatty matter. The bones are broken and boiled with water for about three hours in large cauldrons; the fat floats on the surface and is skimmed off; the bones are taken and thrown into a heap, to undergo a kind of

fermentation, in which the production of heat induces a state of desiccation which fits the bones for calcination.

In these operations the bone undergoes a great alteration: the long boiling in water dissolves a great portion of the gelatine, which is necessary for the production of a good black; and the fermentation and long exposure to the air causes the almost total destruction of the animal matter, so that a bad black is produced for the sake of only 5 or 6 per cent. of fat.

The author states that much more advantageous results may be obtained by the employment of sulphuret of carbon. He proposes to crush the bones almost to powder; then to treat them with this agent, which almost instantly dissolves all the grease contained in them; and from this it may be separated by distillation, which is greatly facilitated by the low temperature at which this fluid boils, and the ease with which it may be condensed. The quantity of grease thus obtained is 10 or 12 per cent., and it is superior to that procured by boiling.

He adds, that the same agent may be applied to the extraction of oils from oleaginous seeds and of the grease from wool. In the latter case, the grease extracted becomes a useful product; it is a butyraceous substance, adapted for the manufacture of some kind of soap.—*Chem. Gaz.*, April 1, 1856, from *Comptes Rendus*, February 4, 1856.

TEST FOR CARBONATE AND IODATE OF POTASH IN IODIDE OF POTASSIUM.

Ry MR. WILLIAM COPNEY.

That substances used in medicine should be absolutely pure, however desirable, is not always practicable; that they should, however, be of such a degree of purity as not to affect their uses, is imperative.

Iodide of potassium is one of those preparations which, in the present Pharmacopœia, are consigned to the list of the *Materia Medica*, no formula being given in the part appropriated to "preparations and compounds," "inasmuch as"—it is stated in the preface—"we have these medicines so adapted to our use, that we have no occasion to prepare them ourselves;" a statement, it may be observed, somewhat refreshing after the whole-

sale declarations which have recently been put forth about the adulteration of drugs and chemicals.

In this notice all mention of impurities other than the above is omitted. Although the great bulk of iodide of potassium, prepared for medicinal use, is sufficiently pure to be "adapted" for medical purposes, it rarely happens that it is entirely free either from carbonate of potash or iodate of potash, or both. The manufacturer has a difficulty to perform—to produce an article not only pure, but in well-defined crystals and free from color. A compound consisting of nothing more than iodine and potassium, united in their equivalent proportions, is not very stable in respect of color; being somewhat hygroscopic, water as well as carbonic acid is absorbed from the air, hydriodic acid and carbonate of potash are formed, and the salt acquires a yellow tinge, a change which is the more noticeable if it be in a state of powder, in which form it is used in some establishments, having been prepared by the purification of the commercial article, the solution thus obtained being evaporated to dryness.

In purchasing the salt, although it may be always expected that the bodies before mentioned will be present, it is of course desirable to select the sample which contains them in the smallest proportion—any test which shall enable us to do this quickly and with certainty, may not be unwelcome.

The reaction on litmus paper, effervescence with a dilute acid, turbidity of the solution with chloride of barium or lime water (which, when "slight," according to the late Mr. Philips, "need not be noticed"), and the formation of a bluish precipitate with protosulphate of iron,—indicating potash or its carbonate; and dilute hydrochloric acid for the iodate, really leave little to desire. The protosulphate of iron, although an excellent test—the most delicate of those enumerated—has not the advantage of the chemical constitution and relationship possessed by the compound now proposed—the protiodide of iron, in the form of the recently and carefully prepared *Syrupus Ferri Iodidi P. L.*

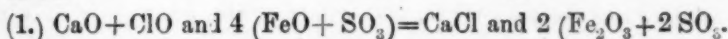
The usual precautions as to equal quantities and similar circumstances being observed, a drop of the syrup is to be added to each sample dissolved in distilled water; a bluish precipitate is, in most cases, formed at once, which retains this color for some little time—the peroxidation of the iron being somewhat retarded by

the small quantity of sugar present. If iodate, however, be present, the precipitate becomes red almost immediately. The samples under examination are set aside, oxidation proceeds, and the precipitates subside; the relative quantity of each is noticed and registered accordingly. If, in the use of this test, iodate is suspected, it may be subsequently shown more distinctly by means of the usual test of hydrochloric acid.

To establish the trustworthiness and value of the test now proposed, some iodide of potassium was prepared as pure as possible; to a solution of this a drop of the test was added—no change occurred, nor was there any indication of a precipitate after standing twenty-four hours. One drop of a solution, containing one grain of carbonate of potash dissolved in a thousand grains of distilled water, was now added, and a pale blue precipitate ensued. A second specimen was prepared, containing both carbonate and iodate of potash; on adding the test first a deeper and then a red precipitate was formed. A third, containing iodate only, was now made—the test being added, a red precipitate formed immediately.—*Pharmaceutical Journal, May, 1856.*

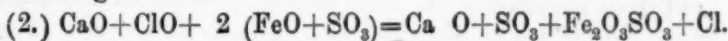
VALUATION OF CHLORIDE OF LIME BY MEANS OF SULPHATE OF IRON.

Wittstein and Claude have made some comparative experiments on the valuation of bleaching powder, and have come to the conclusion that the reaction with sulphate of iron is not capable of affording accurate results. The reaction is supposed to be—



However, in making the experiment, there is always an evolution of chlorine, even before the whole of the protoxide of iron is converted into peroxide. Moreover, by comparing the results obtained by the valuation with sulphate of iron and those obtained with arsenious acid, the latter always gives higher percentage.

The evolution of chlorine is owing to the reaction being of the following nature:—



Supposing that the chlorine were at once completely evolved, seventy-eight parts of sulphate of iron would correspond with twenty of available chlorine. This, however, is not the case, because the liberated chlorine does not escape entirely from the solution so long as protosulphate of iron is present, but abstracts iron forming perchloride.



The smaller the quantity of chloride of lime that comes in contact with the sulphate of iron in a given time, the more perfect is the conversion of this liberated chlorine into perchloride of iron, but towards the end of the experiment there is always an escape of chlorine, because the quantity of protoxide of iron is then very small.

It follows, therefore, that although a given quantity of chloride of lime will oxidize much more protosalt of iron than is supposed to be in the equation (2), still it is impossible to oxidize four equivalents by means of one equivalent of hypochlorite. It is obvious that the loss of chlorine which takes place in this manner, varies according to the circumstances of the experiment.—*Ibid*, from *Vierteljahresschrift für Prakt. Pharmacie*, iv., 555.

PREPARATION OF NEUTRAL SULPHATE OF ATROPIA.

By M. CH. MAITRE.

Take of crystallized atropia 10 grammes, (154.3 grs.,) dissolve in it a sufficient quantity of perfectly pure ether free from water, and of the sp. gr. 66° Baumé. Then prepare a mixture of pure sulphuric acid and alcohol of 40° Baumé in the proportion of one gramme (15½ grs.) of acid to 10 grammes of alcohol, and throw the mixture drop by drop into the solution of atropia. The liquid loses its transparency, becomes milky and deposits on the sides of the vessel a voluminous precipitate having a viscid appearance. When this precipitate ceases to form, the supernatant ether is decanted and the vessel containing the residue put in the drying closet. The sulphate of atropia soon dries completely, and is presented in the form of a white powder, perfectly neutral, very soluble in water, and precipitates chloride of barium abundantly.

For this process to succeed well, it is necessary to operate at the lowest possible temperature, and to use the solvents carefully freed from water, to which end their strength should be carefully verified, and the sulphuric acid should be monohydrated, (66° Baumé.) Finally, the operator should use litmus paper, so as to avoid an excess of acid, and to be able to control the neutrality, a portion of the ethereal solution of atropia should be reserved and used to restore the neutral condition of the liquid.—*Repertoire de Pharmacie.*

REMARKS ON HASCHISCIN AND ITS PHARMACEUTICAL APPLICATIONS.

By M. J. LANEAU,

Chief Pharmacien to St. John's Hospital at Brussels.

It is known that haschisch and haschiscin were first employed in the East for epidemic cholera. Lately, haschiscin having been used with some success in the treatment of cholera patients at the Hospital of St. John, by Dr. Victor Uytterhoeven, I propose to make known some new facts relative to its chemical history and to the manner of prescribing it.

Haschiscin, or cannabin, is the active principle of Indian hemp, *Cannabis indica*, a plant of the natural order Cannabineæ. It possesses narcotic properties very decidedly, and similar in all respects to those that characterize the flowering summits of the plants and the different preparations known to the Orientals, under the names of *haschisch*, *malach*, *madjound*, *dor-vanesk*, *gunjah*, *cherrus* and *cherris*. To obtain haschiscin with the proper qualities, it is necessary to use hemp that is grown in countries where the climate causes the development of this principle, which is not the case with the hemp of temperate climates.

M. Gastinel, pharmacist at Cairo, has suggested a simple process for the preparation of haschisch. With the dried plant he makes an alcoholic extract, which is then treated with water to free the resinous principle from extractive and other matters, when it is dried.

The author believes it to be more eligible to operate directly

on the powdered hemp tops in a displacement apparatus, with a mixture of alcohol and ether or chloroform. The solvent can be regained by distillation, and serve for a subsequent operation. The residue collected and dried ought to constitute the same substance as that obtained by M. Gastinel.

The active principle of hemp being a fixed substance, there is no fear of submitting the plant to distillation, as it is well known that water distilled from hemp possesses none of the narcotic or excitant properties of the plant.

Haschiscin,* as obtained by Gastinel's process, is a complex product, dry, extract-like and resinoid, of a deep green color, with a sweetish taste without any bitter after-taste. Having found different results from those published in reference to its solubility in alcohol, the only menstruum indicated, I have sought those menstrua in which it is soluble *in the cold*, which at the same time present a therapeutic interest.

Haschiscin is insoluble, in the *cold*, in alcohol of 80 to 90 per cent.; it dissolves with heat, but a notable quantity of resin separates by cooling.

It is soluble in the cold, in all proportions, and more or less promptly, in alcohol of 80 or 90 per cent. containing one-third of ether 56° B., in absolute alcohol, rectified ether, acetic ether, sweet spirit of nitre, chlorohydric and chlorinated chlorohydric ethers, in chloroform and in sulphuret of carbon.

It dissolves with the same facility, in the cold, in the essential oils, both the hydrocarbons, oil of turpentine, lemons and juniper, in the oxygenated oils mint, cinnamon, chamomile and lavender, and in the sulphuretted oils, such as that of mustard.

The fixed oils, as those of olives and almonds, dissolve it almost entirely, aided with heat and retain it on cooling.

Subjected to incineration, haschiscin leaves very little ashes.

* The cannabin or pure hemp resin is a purer product than the haschiscin of Gastinel. It is obtained by the Messrs. Smith of Edinburg, by treating the gunjah or hemp tops with repeated effusions of water till exhausted, then with a solution of carbonate of soda, after which it is washed with water and dried. After being thus deprived of inert matter, the hemp is exhausted with alcohol, the tincture treated with milk of lime, (1 lime to 12 gunjah,) the lime precipitated by SO_3 , the filtered liquid agitated with animal charcoal, filtered, evaporated partially, and the resin precipitated with water and dried.—EDITOR AM. JOURN. PHARM.

100 parts yield 0.2 per cent. The ashes are white, with some yellowish points; they do not effervesce with acids, they slightly blue reddened litmus paper, and attract very little moisture from the air. I have recognized among their constituents chlorine, silicic acid, phosphoric acid, magnesia, lime, soda and oxide of iron. I think the alkalinity of the ashes is due to the formation of a little subchloride of magnesium during the incineration.

In reference to the formulæ for the administration and application of haschiscin, it is best, in the preparation of the tincture, to modify it in view of the subsequent use made of it, so as to avoid the precipitation of the resin by certain intermediums. Nearly all the resin separates and adheres to the glass in the only mixture suggested by M. Gastinel.

A small quantity of a mixture of sugar and gum arabic in powder is sufficient to retain haschiscin in suspension in a mixture during several days; in this manner its action is more prompt and more decisive, and the patient has the advantage of taking comfortably all the prescribed dosè, which is a point of some importance.

The following formulæ I have composed, and some of them have been much employed at St. John's Hospital during the last epidemic cholera:

Tincture of Haschiscin.

Take of
Haschiscin a drachm (Troy)
Absolute alcohol 9 " "
Dissolve without heat.

Balsam of Haschiscin.

R. Haschiscin 3ss.
Oil of spearmint 3iiss.
Dissolve without heat.

Mixture of Haschiscin.

R. Tincture of haschiscin 3j.
Sugar in powder,
Gum arabic in powder aa 3ij.
Simple syrup f3vj.
Mint or cinnamon water f3iij.

Mix the sugar and gum in a mortar, introduce the tincture by drops with trituration, then add the syrup, and afterwards, little by little, the distilled mint water.

Ethereal Tincture of Haschiscin.

R. Haschiscin 45 grains,
Alcohol 835 sp. gr. 4½ dr. Troy.
Ether (rectified) 2¼ " "
Dissolve without heat.

Oil of Haschiscin.

R. Haschiscin ðj.
Olive or almond oil 3xxv.
Dissolve, with heat, and filter.

Emulsion of Haschiscin.

R. Oil of haschiscin 3ss. to 3j.
Gum arabic in powder 3ss.
Simple syrup f3vj.
Orange-flower water f3iij.
Mix according to art.

Saccharole of Haschiscin.

Take of Tincture of haschiscin $\text{3}^{\text{ss.}}$ (Troy.)
 Sugar in powder 3ij.

Triturate and allow the alcohol to dissipate by evaporation, and then divide into eight powders.

This saccharole can be preserved a long time; dissolved in a little water, the resin remains suspended and can be taken readily.

If it is desirable to associate an aromatic, an essence may be used to make the tincture of haschiscin; and such other medicines as the physician may desire to associate, as calomel, ipecac, sulphate of quinia, etc., may be introduced. These mixtures can be converted into lozenges or pastilles at will.

<i>Alcoholic Syrup of Haschiscin.</i>		<i>Chloroformic Syrup of Haschiscin.</i>	
R. Haschiscin	grs. iij.	R. Haschiscin	grs. iij.
Absolute alcohol	gtt. xx.	Chloroform	gtt. xx.
Simple syrup	f℥j.	Simple syrup	f℥j.
Mix sec. art.		Mix sec. art.	

Rep. de Pharm., Mars, 1856, from Journ. de Med. de Brux.

ON HYDROCYANATE OF MORPHIA AND ITS THERAPEUTIC USES.

BY M. VANDER CORPUT.

Hydrocyanate of morphia may be prepared directly, by heating freshly precipitated morphia, suspended in water or dissolved in alcohol, with hydrocyanic acid, or by saturating morphia moistened with water with vaporous hydrocyanic acid.

It can also be obtained by double decomposition in treating the muriate, sulphate or acetate of morphia by cyanide of potassium. The resulting salt is collected on a filter, washed with distilled water and dissolved in alcohol, from which it is obtained in beautiful crystals by evaporation.

Morphia, as is the case with all the other vegetable alkaloids containing but one equivalent of nitrogen, requires but one equivalent of cyanhydric acid for forming a neutral salt with the formula $\text{M} + \text{HO}, \text{HCy} = \text{C}^{\text{34}} \text{H}^{\text{10}} \text{N}, \text{O}^{\text{6}} + \text{HC}^{\text{2}} \text{N} + \text{HO}$.

Precipitated hydrocyanate of morphia presents the form of a crystalline white powder. By evaporation from its alcoholic

solution it crystallizes in brilliant quadrangular long prisms grouped in stars.

This salt has a taste slightly bitter. It is but sparingly soluble in water; in the fixed oils slightly, but is more soluble in alcohol; one part of the salt requiring 500 parts of alcohol, 1000 parts of almond oil and 6000 parts of water. Ether is without action on it.*—*Annuaire Therapeutique*, 1856.

*[M. Vander Corput suggests formulæ for the administration of this salt in the way of syrups, pills, powders, suppositories, liniments, etc., but so far as can be judged, by his description of its properties, solubility, &c., it appears to have little merit over the alkaloid morphia. He gives it in doses of from 5 milligrammes to 3 centigrammes in 24 hours, (1-14th, 3-7ths of a grain.)—*EDITOR AM. JOUR. PHARM.*

Varieties.

On Oils, as promoting the Poisonous Action of Cantharides.—The solubility of cantharidin in oils has led Orfila, Taylor, Christison, Mitscherlich, Oesterlen and other toxicologists, to promulgate cautions against the use of fatty matters in poisoning with Spanish flies. On the other hand, Clarus, in his "*Handbuch der Speciellen Arzneimittellehre*," considers that there are no grounds for this caution. Professor Schroff, of Vienna, who has performed a number of experiments on the action of Spanish flies and cantharidin, has published the results of the administration of these substances in combination with oil. Three rabbits—two of four and six months old respectively, and one full grown—had the poison given to them. To the first was administered $15\frac{1}{2}$ grains of powdered cantharides, rubbed up with olive oil; to the second, $7\frac{3}{4}$ grains, prepared in the same way; and to the third was given $1\frac{1}{2}$ grains of cantharidin, similarly prepared; to each were also administered several table-spoonfuls of olive oil. The results, compared with cases in which the poison was given without oil, were the following:

1. The symptoms during life were identical in both classes of cases.
2. Death occurred soonest in the cases in which oil was given. Fifteen grains of cantharides with oil caused death in four hours; without oil, in five hours. Seven and a half grains with oil destroyed life in nineteen hours; without oil, in twenty-six hours. One and a half grains of cantha-

ridin, with oil, killed the animal in four hours; without oil, in from seven to ten hours.

3. The post-mortem appearances give evidence of less action of the poison on the parts with which it comes in contact, where oil is given, than when the poison is taken alone. In the three rabbits poisoned as above related, there was no vesication of the tongue; and the inflammation of the stomach and intestines was less than in cases of the other class. On the other hand, the signs of inflammation of the urinary system were more strongly marked where oil was given. The bladders were contracted and empty; the kidneys were much injected; and the urinary mucous membrane presented on its surface a large quantity of epithelium, nuclei and blood corpuscles.

The practical deduction from these experiments is the confirmation of the prohibition of the use of oil in cases of poisoning by cantharides.—*British and Foreign Med. Chirurg. Review*, from *Wochenblatt der Zeitschrift der K. K. Gesellschaft der Aerzte zu Wien*, Nos. 48 and 49, 1855.

Poisoning by Sulphuret of Carbon among Workmen in India-Rubber Manufactories.—At the meeting of the Academy of Medicine in Paris, on January 15th, M. Delpech stated that he had arrived at the following conclusions with regard to the workmen in India-rubber manufactories:

1. That such workmen are liable to accidents, which consist in (a.) loss of appetite, nausea, vomiting, diarrhoea, or constipation; (b.) disturbance of the intellectual functions, hebetude, loss of memory, extreme restlessness, and unaccountable violence; (c.) more serious disturbance of the nervous functions—cephalalgia, vertigo, disturbance of sight and hearing, impotence, and various forms of paralysis.

2. That experiments made on men and animals, who are affected in the same way, lead to the conclusion that the symptoms are due to the inhalation of the vapor of sulphuret of carbon.—*Ibid*, from *Gazette Médicale de Paris*, January 19th, 1856.

Poisoning by Gamboge.—A delicate Parsee female, aged nineteen, took about three drachms of pipe gamboge for the purpose of self-destruction. Five hours afterwards she was collapsed from the violent purging and vomiting, which commenced about two hours after taking the drug. The matters ejected were of a deep yellow color, and the pain and suffering very great. Stimulants were given and frictions employed, and the collapse passed off; but the straining, griping and evacuation of yellow mucus continued for some days. She ultimately recovered.—*Ibid*, from *Transactions of the Medical and Physical Society of Bombay*, 1855.

Formula for the Administration of Phosphate of Lime.—The majority of physicians have abandoned the use of phosphate of lime on account of its insolubility; in fact, when it is given alone, it is almost inert. According to Mr. Kuckenmeister of Zittau, this is no longer the case when this salt

is combined with the carbonate of the same base; and with the addition of an acid, a soluble combination and truly useful medicine is then formed. The following are the proportions recommended by the author: Carbonate of lime, two drachms; phosphate of lime, one drachm; sugar of milk, three drachms. M. Kuchenmeister sometimes adds from fifteen grains to half a drachm of lactate of iron, and directs three pinches of the powder to be taken at the commencement of a meal. The chief object of the addition of the carbonate to the phosphate of lime is to facilitate the solution of the latter. Under the influence of lactic acid or of hydrochloric acid, which nominally exists in the digestive tube, the carbonic acid of the carbonate is disengaged, and a portion of the lime is rendered soluble. The sugar of milk is intended to furnish lactic acid. Finally, the author remarks, that in order to determine the solution of the phosphate of lime, it is necessary to bring it into contact with albuminates, which occurs when it is administered with food.—*Charleston Med. Journ. and Review*, from *Presse Médicale Belge*, January 27, 1856, p. 42. *Dublin Med. Press*.

Juice of the "House-Leek" Curative of Warts.—The following facts were lately stated to us by Dr. W. W. Codman, of this city. One of his children, a boy of five years, had an abundant crop of warts upon the face and hands. All the usual means were unavailingly and perseveringly tried for their removal. Lunar caustic, and even excision, wholly failed to eradicate them. By casual recommendation, the juice of the common house-leek (*Semperivum Tectorum*, said to grow abundantly among us,) was applied to the warts a few times, with the result of causing their entire disappearance in a very short time. So manifest was the action, that no one could refuse to assign the credit of the cure to the juice of the plant used. Should this be found successful on renewed trial, it will certainly be a very valuable, as well as a simple and easily procured remedy.—*Boston Med. and Surg. Journ.*

Muriate of Morphia and Coffee in Neuralgia.—M. Boileau reports that he has derived great relief in the paroxysms of neuralgia, from the administration of the muriate of morphia in a very hot infusion of highly-roasted coffee. The dose is one centigramme (one-seventh grain) for an adult, and less in other ages and in peculiar temperaments. This may be repeated when a violent paroxysm recurs, and if necessary it may be increased by frictions; but M. Boileau has never gone beyond two centigrammes.—*Ibid.*, from *Med. Times and Gazette*.

Consumption of Quinine.—The Philadelphia Medical and Surgical Journal says that 300,000 ounces of quinine are annually consumed in the United States, meaning, it is presumed, imported, as there are two very large manufacturing establishments in this country which prepare it on an extensive scale, and which are not included in the computation of the Sec-

retary of the Treasury, from which the above estimate is derived. It is worth, at the present time, about \$3 the ounce.—*Ibid.*

Glycerin Jelly.—There is no published formula for the article sold under this name, but in answer to many inquiries on the subject, we insert the following formula, by which a preparation exactly similar in appearance and effect is made:

R.	Saponis mollis, P. L.	℥ss.
	Mellis purif.	f. ʒij.
	Ol. Olivæ pallid.	℥v.
	Perfume, ad libitum.	

First intimately mix the soap with the honey, then gradually add the oil, stirring without intermission until all the oil is taken up. Care must be taken not to add the oil too fast.

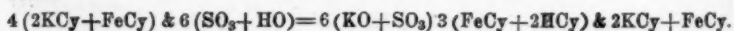
A correspondent has sent the following formula:

Powdered gum arabic, $\frac{1}{2}$ oz., syrup, 4 oz., made in the proportion of 3 oz. of sugar to 1 oz. of water, the yolks of three eggs, olive oil, 4 oz., glycerine, 2 oz.; rub the gum and the syrup well mixed together, then add the yolks of eggs, and when well mixed, add gradually the oil and glycerine, previously mixed together.—*London Pharm. Journ.*

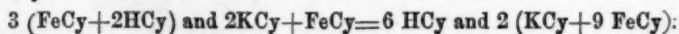
Test for Strychnia.—Mr. J. W. Slater, Analytical Chemist, Sheffield, in a letter to the *Times*, March 26, proposes the following test for the detection of strychnine: "A few drops of pure sulphuric acid are mixed with an equal bulk of water and allowed to cool. Chlorate of potash, in fine powder, is then added, and the suspected substance introduced. If strychnine be present, an intense maroon red color appears, gradually fading into a rose-violet. In principle this process agrees with the ordinary test, but the materials used are much less capable of producing any varied play of colors."—*Ibid.*

Preparation of Hydrocyanic Acid.—Wittstein has examined the reactions that take place in the preparation of hydrocyanic acid from ferrocyanide of potassium and sulphuric acid, and comes to the conclusion that—

1. The first action consists in the formation of sulphate of potash and hydroferrocyanic acid, while one-fourth of the ferrocyanide remains unaltered.



2. When heat is applied the hydroferrocyanic acid is decomposed into hydrocyanic acid and cyanide of iron, which latter combines with the unaltered ferrocyanide of potassium, forming an insoluble substance, $\text{KCy} + 2\text{FeCy}$.



3. The insoluble substance is partially decomposed by access of air; the

potassium of the decomposed portion being separated and removed by the water used for washing; while the cyanide of iron is converted, by combination with the cyanogen, into Prussian blue, and by oxidation of a portion of the iron into basic Prussian blue. The amount of Prussian blue in the blue substance is about 10 per cent.—*London Pharm. Journ.*, from *Vierteljahrsschrift für Prakt. Pharmacie*, iv. 515.

Composition of the Yellow Substance obtained in the Molybdic Acid test for Phosphoric Acid.—Nutzinger has analyzed this substance, and finds that, when air dried, it consists of—

	I.	II.	Calculated.
Water	1.875		
Ammonium oxide	3.407	3.481	5 3.557
Phosphoric acid	3.738	3.818	2 3.962
Molybdic acid	90.740	92.701	48 92.461
	<hr/> 99.760	<hr/> 100.000	<hr/> 100.000

When heated at 212° it loses water, and has the composition II.

The chemical constitution of this substance is obscure, and will probably be rendered intelligible only by a more intimate knowledge of the compounds of molybdic acid generally.—*Ibid*, from *Ibid*, iv. 549.

The Kumis and Raky of the Tartars.—The Calmucks and most of the shepherd tribes of Central Asia prepare from the milk of their cattle two kinds of beverage. The one is called "Kumis," and is sour milk which has undergone a certain degree of vinous fermentation; it corresponds with the "pinna" of the Laplanders, which is made with reindeer milk.

The other beverage is an intoxicating, agreeably-flavored liquid, obtained from "Kumis" by distillation. The Calmucks make the distillation in a vessel of unburnt clay, a piece of reed serving for the delivery tube; the receiver is covered with wet clay so as to condense the vapor. The distillation is sometimes effected with reeds or dried herbs for fuel, but more generally with the dung of cattle, especially the dromedary, previously dried in the sun.

Good "kumis" cannot be obtained from every kind of milk. That made with the milk of cows or of sheep is bad. The milk of camels, and of mares particularly, gives three times as large a product.

The "kumis" is prepared by mixing six parts of warm milk with one of warm water, and some old "kumis" as a ferment; then fermenting with frequent agitation. Artificial temperature and agitation appear essential for the fermentation.

The spirit obtained from "kumis" by distillation is called "rak," or "raky." This word is evidently derived from "arak," which is the name given by the Indians to their spirituous liquors.

The preparation of these beverages is the office of the women.—*Ibid*, from *Union Médicale, Journ. de Pharm.* xxvii., 196.

Florida Indigo.—Indigo was formerly cultivated in Florida, for which the climate and soil is well adapted. It grows wild upon the barrens in almost every portion of the Peninsula. When cultivated by the English in this country, the Indigo of Florida was considered in the London market superior to all others, except that of Caraccas. The manner of cultivating and manufacturing advantageously is as follows:

The seed, which is very small, is soaked for some twelve hours, then mixed with ashes or sand, and sown in drill rows, about eighteen inches apart. The time for sowing in Florida is from the middle of March to the first of April. When the young plant makes its appearance, it resembles white clover, and must be carefully weeded, and the earth kept loosed about its roots. Three weedings are sufficient to carry it up to the first cutting, which commences when the plant begins to bloom, say about the first of July. The plant is so easily injured by the sun after it is plucked, that the cuttings should be in the afternoon. As fast as it is cut, which is done by a sickle, it is carried to a vat called the steeper. This vat is made of plank, is water-tight, and varies in size according to the extent of the operations of the planter. The steeper is filled with cuttings immersed in water. Planks with weights upon them are then placed on top to keep the cuttings beneath the water. In this state steeping is continued for about ten hours, or less, according to the temperature of the water. When the water assumes an olive color, it is drawn into the "beater," another vat placed alongside and beneath the steeper, and connected by a tube, and fastened with a valve or spigot. The liquid is now churned by hand or with machinery, until it becomes lighter in color, and a blue fecula begins to make its appearance. From time to time lime water is thrown into the beater during the "churning." After the fecula spoken of distinctly appears, the water is suffered to remain about four hours for the Indigo to settle. It is then drawn off, the sediment placed in bags, and hung up to drain. When drained sufficiently, it is placed in boxes to dry, under gentle pressure; and when dried firm, it is cut up into square cakes and placed in the shade, to become completely dried by evaporation. The shorter the steeping and the less the beating, the lighter will be the color of the Indigo. The Indigo plant will yield two or three cuttings a season, and one hand will cultivate about three acres, the result being from 175 to 200 lbs. of the article. Unlike sugar cane or corn, the Indigo requires no expensive machinery. Where it is made only for domestic use, barrels are used for steeping and beating.—*Florida News*.

American Tamarinds.—William M. Singleton, Esq., of Winchester, Va., has succeeded in obtaining a fine growth of tamarinds, from seeds procured at a confectioner's shop. One of these trees, eight years old and measuring

six inches in diameter, last year perfected fruit of a quality quite equal to that imported. In addition to its value for fruit, it is a most beautiful ornamental tree, having a rapid growth, symmetrical form and beautifully delicate foliage.

This tree is worthy of a trial upon the Western prairies. The seed may be sown either in fall or spring, in drills about four inches apart, and covered with two or three inches of light rich soil. It is preferable to sow late in the fall, in order that the hulls may be acted upon by the frost. When the shoots are about three feet high, they may be transplanted to the sites where they are to remain permanently. A handful of tamarinds from a fruit store will supply any one with seeds for a trial.

Composition for Coating Iron on Ships' Bottoms.—An English mechanic has invented a composition for coating iron and other ships' bottoms. The following is the mode of carrying out the invention:—Take 6 cwt. of mineral or Turkish asphaltum, or best purified coal pitch, melt and boil it for six hours; then allow it to cool to the temperature of 240 degrees Fahrenheit. Mix previously 6 cwt. of best purified ground plumbago, together with 60 lbs. of arsenite of copper, finely pulverized, with 80 gallons of rectified coal-tar-naphtha; when the plumbago, arsenite of copper and naphtha are well mixed, add to the melted asphaltum at the temperature of 240 degrees. The whole must be well mixed together and applied like paint.

Wires of the Electric Telegraph.—The wires now instead of being exposed, in Paris, are under ground. A trench is dug twelve or fifteen inches wide, in which the wires are placed side by side, but so as not to touch each other. Liquid bitumen is then poured on them, which surrounds the wires and completely isolates them. It secures them from the danger of being exposed to malevolent persons and of being deranged by atmospheric influence. The wires from the Tuilleries to the ministry of the interior have been laid down in this manner, and others are in course of execution on the quays and in the Rue Richelieu. The same plan is to be adopted at Lyons.

Self-Closing Faucets.—Mr. Tuthill, of Boston, has introduced to the public some self-closing faucets for the supply of water or other fluids, the peculiarity being that there is no drip nor waste, and also an instantaneous full stream. Vulcanized rubber forms the internal spring and packing to close a valve acted upon by pressure with the finger. It is in the truest practical sense a self-closing contrivance, as the fluid can only run so long as the pressure of the hand is upon the valve.

Anti-blenorrhagic Opiate. (Beyraud).—Take of copaiba 10 drachms, calcined magnesia 4 drachms, powdered alum 15 grs., catechu 1½ drachms, cubeb 9 drachms, crude opium 15 grs., essence of mint and cinnamon of each 10 drops. Mix. •

Of this opiate M. Beyraud directs a teaspoonful three times a day.
Annuaire Therapeutique, 1856.

Dover's Powders of the Germans.—

Take of Powdered ipecacuanha,	. . .	2 grains.
Powdered opium,	. . .	2 "
Powdered nutmegs,	. . .	12 "
Powdered columbo root,	. . .	12 "
Sugar,	. . .	4 drachms.

Mix well by trituration, and divide into 12 powders. One every hour.
Annuaire Therapeutique, 1856.

Syrup of Coffee.—[Some of the apothecaries of New York and elsewhere have introduced among their mineral water syrups, a syrup of coffee. The following formula, taken from Dorvault's "Officine," is offered to those who incline to try this new mode of taking a glass of cold coffee. With the addition of cream it would doubtless be much improved as a beverage,—to most persons.—EDITOR AM. JOURN. PHARM.]

Take of Coffee, roasted and ground,	. . .	lb. j.
Simple syrup,	. . .	lb. viii.
Boiling water, q. s.		

Treat the coffee, by displacement in a proper apparatus, with the boiling water until two pounds of liquor have passed, put the syrup on the fire and evaporate until it loses lb. ij, then add the infusion of coffee and strain. [Two table spoonfuls of this syrup to a cup of boiling water or milk will make a cup of coffee. For mineral water it may be less concentrated, and may be diluted with simple syrup.]

NOTICE.

To the Pharmacutists and Druggists of the United States.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The third Article, 1st Section of the Constitution, requires the President, at least three months previous to the annual meeting, to publish a call in such Journals as he may select, stating therein the object of the Association and the conditions of membership. In compliance with this duty, you are hereby notified that the next Annual Meeting of the Association will convene in the city of Baltimore on the second Tuesday, (the 9th) of September, at 3 o'clock, P. M.*

* [In a letter just received from Mr. W. S. Thompson, Secretary of the Maryland College of Pharmacy, we are informed that the President of that Institution had obtained the lecture room of the Baltimore College of Dental Surgery, corner

The objects of the Association are to deliberate on the condition of our profession, the advancement of pharmaceutical knowledge, and the elevation of the professional character of Druggists throughout the United States. The following extracts from the Constitution exhibit the Conditions of Membership.

Conditions of Membership.

SECTION 1. Every apothecary and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, who, after duly considering the objects of this Association, and the obligations of its Constitution, is willing to subscribe to them, is eligible to membership.

SECTION 2. The mode of admission to membership shall be as follows: Any person eligible to membership may apply to any member of the Executive Committee, who shall report his application to the said committee. If after investigating his claims they shall approve his election, they shall, at the earliest time practicable, report his name to the Association, and he may be elected by two-thirds of the members present on ballot. Should an application occur in the recess, the members of the committee may give the approval in writing, which, if unanimous, and endorsed by the President, shall constitute him a member, and the fact be reported to the Association at the next succeeding meeting.

SECTION 4. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution. Members shall be entitled, on the payment of five dollars, to receive a certificate of membership signed by the President, one Vice President and the Secretary, covenanting in writing to return the same to the proper officers on relinquishing their connection with the Association.

SECTION 5. Every local Pharmaceutical Association shall be entitled to five delegates.

JOHN MEAKIM, President.

New York, April, 1856.

of Hanover and Lombard streets, Baltimore, for the meeting of the American Pharmaceutical Association in September next. A Committee will be in waiting at the room, between the hours of 4 and 6 P. M., on Monday the 8th, to receive such members or strangers proposing to attend as may be in that city. The time of meeting is at 3 o'clock, P. M., on Tuesday the 9th.—EDITOR AM. JOURN. PHARM.]

Minutes of the Maryland College of Pharmacy.

BALTIMORE, June 5th, 1856.

At the stated monthly meeting this evening, the President, DR. GEORGE W. ANDREWS, in the chair, the Board of Trustees reported the organization of the School of Pharmacy, on a plan similar to that of the Philadelphia College. The following gentlemen have been elected Professors, viz.:

DR. LEWIS H. STEINER, Chemistry.

DR. CHARLES FRICK, Materia Medica.

MR. I. J. GRAHAME, Practical Pharmacy.

Mr. Thompson submitted formulæ for compound syrup of ipecacuanha and powdered blue mass, which were read, and, on motion of Mr. Moore, ordered to be placed on file for future reference.

On motion of Mr. Grahame, the subject of powdered blue mass was referred to a Committee, with instructions to report at a future meeting on the merits of the several formulæ extant. The Chairman appointed Messrs. Grahame, Sharp and Charles Caspari.

On motion of Mr. Moore, a Committee was appointed to procure a suitable room for the annual meeting of the American Pharmaceutical Association, which will convene in Baltimore on Tuesday, 9th of September, 1856. The Chairman appointed Messrs. Moore and Grahame.

The meeting then assumed a conversational character, and an animated discussion of the Displacement Process, the nature of the changes which are observed to take place in Syrup Iodide of Iron, and the different methods of preparing Syrup of Ipecacuanha, occupied the remainder of the evening.

Adjourned.

WILLIAM S. THOMPSON, *Secretary*.

Code of Ethics of the Maryland College of Pharmacy.*

Pharmacy being a profession which demands knowledge, skill, and integrity on the part of those engaged in it, and being associated with the medical profession in the responsible duties of preserving the public health, and dispensing the useful though often dangerous agents adapted to the cure of disease, its members should be united on some general principles to be

* [A pamphlet containing the CHARTER, CONSTITUTION AND CODE OF ETHICS of the Maryland College of Pharmacy, has been sent to us. We insert the "Code" entire as being a document calculated, if followed, to effect a great reform in practice.—EDITOR.]

observed in their several relations to each other, to the medical profession and to the public.

With this object in view, as well as the elevation of the professional standard, the members of the *Maryland College of Pharmacy* have agreed upon the following principles for their government in their business pursuits:—

ARTICLE 1.—That we adhere to the *National Pharmacopœia* as our guide in the preparation of all officinal medicines, so far at least as the strength of said preparations is concerned, and also to the mode of preparation, except in such cases where we may conceive the same result attainable by another process believed by us to be preferable. We would except from this restriction any particular preparation that may be specified by a Physician, as, for instance, *Majendie's Solution of Morphia*.

ARTICLE 2.—We discountenance all secret formulæ between Physicians and Apothecaries, and hold it to be our duty to communicate the formula and mode of preparation of any medicine which is used in the practice of a physician, upon the request of a member of this College, where such formula shall have originated with us, and even when we may have otherwise obtained it, unless in the latter instance we would violate a moral principle in so doing.

Furthermore, we hold it to be the duty of every member of this College to communicate at the monthly meetings all improvements in formulæ, manipulation, apparatus, &c., and such useful hints as may have occurred to his mind from time to time in relation to the business, for the sake of adding to the general fund of knowledge and to promote the advancement of the profession.

ARTICLE 3.—As the diagnosis and treatment of diseases belong to the province of a distinct profession, and as a pharmaceutical education does not qualify the graduate for these responsible offices, we should, where it is practicable, refer applicants for medical aid to a regular physician. The oft repeated assertion that many persons are not pecuniarily able to employ a physician, may be met with the fact, that there are several excellent and well managed Dispensaries where medical attendance and medicines are furnished gratuitously.

ARTICLE 4.—We discountenance all connection between Apothecaries and Physicians, either as joint proprietors of stores, or in stores which are owned by Physicians and conducted by Apothecaries under their own names. And being convinced that the practice of allowing Physicians a percentage on the price of their prescriptions, is not only highly disreputable to both the Physician and Apothecary engaged therein, but injurious to the public interest, we do not consider any Apothecary who is guilty of this dishonorable practice, entitled to associate with us as a member of this College.

ARTICLE 5.—The Apothecary should be remunerated by the public for his knowledge and skill, and in his charges should be regulated by the time consumed in preparation, as well as by the value of the article sold;

although location and other circumstances necessarily affect the rate of charges at different establishments, no Apothecary should, intentionally, undersell his neighbors with a view to their injury.

ARTICLE 6.—One of the principal duties of the Apothecary is to supply himself with genuine and pure articles of the *Materia Medica*, and such chemical and pharmaceutical preparations as he may not prepare himself. In the selection of many articles, such as Powders and some Essential Oils, to procure them genuine and unadulterated, it is necessary to rely on the integrity of the wholesale druggist; we therefore, hold it to be our duty to avoid the druggist who would knowingly furnish a sophisticated or impure article of any description whatever; and as compounding prescriptions and dispensing medicines at retail, form no part of the business of the wholesale druggist, but is highly injurious to our trade, we cannot be expected to make our purchases from those who are addicted to either the above practices. Any member of this College becoming cognizant of either of those practices, shall be required to make it known to the College at its next meeting.

ARTICLE 7.—Both Physicians and Apothecaries are liable to commit errors, the former in writing prescriptions, the latter in compounding them; we therefore deem it to be our duty, when we are satisfied that an error has been committed in writing a prescription, to return it to the Physician for correction, and to use commendable tact in concealing the same from the patient, so as to avoid compromising the reputation of the Physician. On the other hand, when the error is on the part of the Apothecary, the Physician should feel bound to screen him from undue censure, unless it is the result of ignorance or culpable negligence; and in cases of errors not arising from either of the latter causes, we should feel bound to protect each other; never giving currency to a report that will affect the reputation of a brother Pharmaceutist, and which may, possibly, have no foundation in fact.

ARTICLE 8.—As there are many powerful substances that rank as poisons, which are constantly kept by Apothecaries, and prescribed by Physicians, and which are only safe in their hands—as Arsenious Acid, some Vegetable Alkaloids, Ergot, Cantharides, etc.,—we hold that the Apothecary is not justified in vending these powerful agents indiscriminately to persons unqualified to administer them, and that a prescription should always be required, except in those cases when the poisons are intended for the destruction of animals or vermin—and in these instances only with the guarantee of a responsible person. And we hold that when there is good reason to believe that the purchaser is habitually using opiates or stimulants to excess, every conscientious Apothecary should discourage such practice.

Editorial Department.

PHILADELPHIA COLLEGE OF PHARMACY.—SCHOOL OF PHARMACY.—In the advertisement of the Lectures of this School hereto appended, the commencement of the lectures is stated October 20th, when it should be October 6th. Our readers will perceive that the lecture evenings have been changed from Tuesday, Thursday and Saturday, to *Monday, Wednesday and Friday*, a change made in accordance with the wishes of a number of employers, who find it inconvenient to spare their apprentices on Saturday evenings.

QUACK MEDICINE LABELS NOT PATENTABLE.—The following remarks and letters are taken from the May number of the New York Journal of Medicine. Dr. Purple appears to have entirely misunderstood the tenor of the letter of Judge Conkling as to the *effect* of withholding copyright from labels on quack medicines. The sole object of such persons in getting their labels patented, is to prevent others from putting up imitations and selling them for genuine. Heretofore the maker of a quack medicine with a patent label could prosecute a party who had his label copied and issued with that intent, but now the quack will not have this protection, according to Secretary Marcy's letter. The medicines themselves are improperly called "patent," as the quack is too shrewd to trust his recipe with the patent officers, who always publish abstracts of their contents. We would have been glad if Dr. Purple's idea had been correct, and a legal restraint put on this great and crying evil, which truly calls for redress from the powers that be.

If we understand Secretary Marcy, he denies the protection of the copyright law to all "mere labels" used as such, and hence patented labels for cod-liver oil, or cotton goods, or cutlery, are equally without virtue in protecting them from imitation.

The Sale of Patent Medicines a Violation of Law—Important Communication from the Clerk of the District Court of the Northern District of New York.—The following correspondence, which we now for the first time make public, clearly establishes the fact, that the traffic in patent medicines, one of the greatest curses from which the community suffers, by the imposition of empirics, is done under the most shallow pretence of legality. It has always been a mystery to us how honest men could be so heedless of public good, as to legalize the indiscriminate sale of such dangerous compounds as many of these nostrums are; but we here have explained the whole secret. As might have been anticipated, from the character of the men engaged in their manufacture, the sale of these drugs is effected fraudulently.

We trust some measures will be taken to put a stop to the sale of these

vile compounds, and bring to justice the violators of law, who poison public health and grow rich thereby. As these nostrums are not truly patented, the secret of their preparation being studiously withheld in defiance of the explicit declaration of our Patent Laws, we would suggest the passage of a law imposing a heavy penalty for the sale of "patented" medicines, when in fact they are not patented, and allow half the fine recovered, to the informer. It would be a truly philanthropic effort, worthy a Howard, or a Mrs. Fry, to secure the community from this terrible infliction of the sale and use of "patent" medicines.

We cannot sufficiently express our admiration of Mr. Conkling's integrity and enlightened discharge of his official duties. For several years he has uniformly refused to grant these applications to patent labels, from a conscientious belief in the illegality of such proceedings, and a conviction of the worthless character of such compounds. During this time he has not only sacrificed the income which is due from such grants, but incurred the odium and bitter hatred of this miserable class of impostors. In behalf of the medical profession we tender our acknowledgements for the services which he has thus rendered directly to the community at large, and indirectly to legitimate medicine.

From the annexed "circular," it will be seen that Mr. Conkling's views of the Patent Laws, are endorsed by the State Department, and instructions in conformity therewith have been promptly issued by Mr. Secretary Marcy.—*Eds. New York Journal of Medicine.*

BUFFALO, March, 1856.

DEAR SIR:—Will you do me the personal favor to furnish me with a written statement of your views on the subject of copyrights for labels, etc., as expressed to me in a conversation yesterday.

Coming from a gentleman of your rank and position, I am certain that they would possess interest; and I would like to give them publicity through some of our Medical Journals.

Sincerely wishing that the public had many more such faithful servants,

I remain yours truly,

AURELIAN CONKLING, Esq.

FRANK H. HAMILTON.

DISTRICT COURT OF THE UNITED STATES FOR
THE NORTHERN DISTRICT OF NEW YORK,
CLERK'S OFFICE. }

BUFFALO, March 18th, 1856.

DEAR SIR:—I am much obliged for the interest manifested by you in the subject with which I lately troubled you; and although it is probable that in your politeness you over-estimate the importance of the views expressed to you, and of those contained in my letter to the Hon. S. G. Haven, still it is possible that they may be useful to others, and I therefore will proceed to repeat them here, for such use as you may deem expedient. I am much pleased with the polite interest you manifest in the subject under consideration, because, I regret to say, I have heretofore experienced very different treatment from some persons who have found their way into your profession, and who not only so far forgot their professional obligations, as to manufacture nostrums, but were also guilty of low abuse of an officer whose sense of duty would not admit of his being made instrumental, improperly, in imposing their mixtures upon the public.

The immediate purpose of my letter to our representative in Congress, was to invoke the attention of the Department of State to what it seems to me is a great abuse and perversion of the provisions of law in relation to *copyrights*. The subject of copyrights is under the general supervision and control of the State Department of the United States; and officers who have subordinate duties to perform must, to some extent, be subject to directions and instructions from that department. Applications are frequently made to me, to record, under the provisions of the law above alluded to, labels of medicines, compounds, and mixtures, of different grades of pretension, from an "elixir of life" or a "diarrhœa cordial," to a hair-dye or a corn-salve.

Upon the occurrence of the first application of this sort, a number of years ago, being asked my reasons for refusing to treat the subject as one embraced in the provisions of the Act, entitled "An Act to amend the several Acts respecting copyrights," I made the following reply, a recital, in part of which, will express the views which have ever since governed me, upon the subject:—

"I am sorry that my views of the Act of Congress, above mentioned, are such as to interfere with your interests or wishes. It is not the province of the Clerk of the District Court to 'grant' anything. His duties are ministerial, and upon the subject of copyrights he is bound to do what he is directed to do, by the Act of Congress.

If I should record the *label* sent by you, and should send you a certificate of the fact, I would thereby 'grant' you nothing, nor would you gain anything, unless the Act of Congress embrace such a subject.

I have examined, with considerable care, the Act of Congress above mentioned, and I will state some of my views upon it; from which you will infer that I do not think proper to record a *label* under that Act.

My opinion is, that the 'map, chart, musical composition, print, cut, or engraving,' must have a value as such, and be intended for sale as such; that whichever it may be, print, cut, engraving, it must have a *title* applicable to itself, which title is to be recorded.

I am also of opinion, that the Act of Congress was designed to promote the acquisition and diffusion of knowledge, and to encourage the production and publication of works of art, the general purpose being to advance the people in civilization and refinement.

I think, furthermore, that, by the Act to which I have referred, Congress did not intend to prevent the imitations of the stamps and labels of any manufactured article, or goods, or merchandise. That is a subject of such extensive interest and importance, that, if it had been the intention of Congress, to embrace it in the provisions of the law, that intention would have been distinctly and unequivocally manifested. It is not likely, however, that such a provision by Congress will ever be found so much out of place, as it would be in 'An Act to amend the several Acts respecting *copyrights*.'

Furthermore, I am quite certain that Congress did not intend that this Act should be so prostituted, as to be made instrumental in deluding the ignorant and inconsiderate, into the purchase and use of the various nostrums, catholicons, and panaceas, which are so much worse than useless to the community."

It is the practice, I am informed, in many of the Judicial Districts, to make records of such labels as are above mentioned, and I suppose it is done to avoid the trouble and ill-will engendered by a refusal. It is entirely clear, however, that such a practice is not in accordance with the intention and design of the Act of Congress above mentioned; and I have no doubt that if the mischiefs of the practice were realized, it would be discontinued.

The course of proceeding above mentioned, is that by which almost the whole number of the mis-called "patent medicines" are brought forth. It would seem to be unnecessary to state, that there is no force or validity whatever in this proceeding, for such pretended purpose.

There are means provided in the Patent Laws, for securing to any individual the exclusive right to "any new and useful art, machine, manufacture, or composition of matter," which he may invent; and the necessary requirements in

order to accomplish the purposes are clearly and definitely prescribed, as follows:—"But before any inventor shall receive a patent for any such new invention or discovery, he shall deliver a written description of his invention or discovery, and of the manner and process of making, constructing, using, and compounding the same, in such full, clear, and exact terms, avoiding unnecessary prolixity, as to enable a person skilled in the art or science to which it pertains, or with which it is most nearly connected, to make, construct, and use the same."

The Act also provides that the inventor shall accompany his application "with specimens of ingredients, and of the composition of matter, sufficient in quantity for the purpose of experiment, where the invention or discovery is of a composition of matter." The Act also provides, that the applicant shall make oath, that he does not know or believe that the composition of matter was ever before known or used. These and the other requirements of the law being complied with, provision is made for a critical examination into the merits and character of the alleged invention; and, "if the commissioners shall deem it to be sufficiently useful and important, it shall be his duty to issue a patent therefor." This, it will be perceived, is a very different course of procedure from that of filing a label in the clerk's office; and a label, not even indicative of the character of the compound it is to cover. The law, it will be perceived, provides for a truthful statement of the ingredients and proportions of every patented compound. The purpose and effect of the provision are two-fold. In the first place, the means are afforded for an intelligent and careful examination into the compound, in order to determine whether it is worthy of the countenance of the government; and, secondly, after the termination of the privileges, secured by the letters-patent, the necessary knowledge is at hand, to make the invention directly available to the public, by furnishing to all, a knowledge of its ingredients and mode of preparation. Moreover, the "letters-patent" themselves, in accordance with their true purport, contain a plain statement of these particulars. There is something *open* in these requirements, and in the whole course of proceeding marked out in relation to patents, and the fact is, just as one would suppose, that there are really very few "patent medicines." The medicines sold as such, are, nearly all of them, utterly destitute of any real basis for the pretence under which they are imposed upon the public.

If the practice of recording labels of medicines shall be discontinued, in the clerk's offices, one important step will be taken towards clearing away the delusion which prevails upon the subject. And if your profession, with that true regard for the general public good which characterizes its *worthy* members, will take the subject in hand, I have no doubt that you can obtain the enactment of penalties against the sale of any medicines under the pretence that they are, when, in truth, they are not, patent medicines. There has been legislation to prevent the adulteration of medicines; but, it seems to me, that it is a more important end to shield the people against the miserable mixtures, which, as things are now managed, are, by the apparent encouragement of the government, imposed upon them. I regret, dear Sir, that this letter has necessarily been so hasty; I do not mean, however, to intimate that its positions are not deliberately taken. Very respectfully, your obedient servant,

AURELIAN CONKLING.

DR. FRANK H. HAMILTON.

CIRCULAR.

DEPARTMENT OF STATE,
WASHINGTON, April 11, 1856.

Mr.,

Clerk of the District Court of the United States.

SIR:—The Act of Congress approved February 3, 1831, entitled "An Act to amend the several Acts respecting copyrights," is "An Act for the ENCOURAGE-

MENT OF LEARNING, by securing the copies of maps, charts, and books, etc., to the authors and proprietors of such copies;" and, inasmuch as mere LABELS are not comprehended within the meaning of said Act, you will, for the future, refuse, in all cases, to record or issue a certificate for the same under said Act.

I am, Sir, very respectfully, your obedient servant,

W. L. MARCY.

THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The period for the Annual Meeting of this Association is rapidly approaching, as will be seen by reference to the call at page 372. In the interval that has elapsed since the last meeting, what have its friends done to forward the reforms aimed at in its establishment? This question will be answered practically by the results of the next meeting. It is for the members, and others of the profession, to determine whether it will be a tame, uninteresting gathering, without spirit to suggest or energy to act; or whether it will exhibit results useful to the profession, creditable to the Association as a scientific body, and amply repaying the members present for the trouble they have taken to meet together. It may be asked by many, in what way can I contribute to this end? my scope is limited, others are better qualified for such work, and will do it. *There is the great mistake.* We are too apt to despise little things, or fancy because they are little they are insignificant. The rich mines of Potosi might have yet remained unknown but for the accidental pulling of a plant by a hunter, who, though not a metallurgist, saw a *something* that induced him to *mention it to others better qualified to judge*, and a thousand millions of silver have resulted. Equally humble was the origin of that golden current, which now ceaselessly flows from California, in the mill-race labors of Captain Sutter. It was the accidental mention of the expulsion of fixed oil from almonds by ether, in the experiments of Boutron-Charlard, that inspired Boullay with the idea of the process of displacement, than which no greater improvement has been suggested in the practice of Pharmacy in latter times. The humblest member of the body has opportunities for observation that *may* point to a new fact of surpassing interest; and, although *he* may not grasp the results that flow from it, yet by *mentioning it to others* he may become indirectly the instrument of great usefulness. It is quite time that the Association had advanced beyond the *organizing period of its existence*; its function of contributing to the progress of science and skill, by developing and directing the talent of the profession in proper channels, should now be called into action by the annual appointment of judicious committees, with a *reasonable amount of labor to perform*, in which they *feel an interest*; by the offer of prizes for special, well defined discoveries or improvements in processes or instruments; and by a generous encouragement to the brethren in every section of our country, to improve their professional standing individually, and by organization. Let our Southern brethren render their genial climate subservient to the cause by the introduction from abroad of valuable drug yielding plants; let the mechanical ingenuity of the North improve our apparatus and discover new processes, and let genius everywhere make use of these in giving greater efficiency to our art as the indispensable handmaid of practical medicine.

Tully's "*Materia Medica, or Pharmacology and Therapeutics.*" Numbers 15, 16 and 17, Jan., Feb., and March, 1856.

Since our last issue, three numbers of this work have been received, which bring it to page 1098 of the first volume. In number 16 are given the general characteristics of the class Erethistica. According to Dr. Tully's definition, "Erethistics are articles which produce a preternatural degree of activity, and an augmented exertion of the powers and energies by which any function is discharged. A mere and pure Erethistic agent may, indeed, be compared to the whip and spur, which do not give any new and additional power or energy, but only bring into greater activity that which already exists, which was not previously exerted, at least to the same extent, and which, perhaps, was latent or prostrated in a greater or less degree." This definition is further explained by many pages of observations on the varieties of Erethistics which are considered in eight groups, the whole occupying 50 pages. To give an idea of the agents thus classed, we may mention as among them, Ignatia Amara, Nux Vomica, Aconitum, Arnica, Kalmia, Veratrum Viride, Sanguinaria, Lobelia Inflata, Sabadilla, Colchicum, Cimicifuga, Pulsatilla and Mezereum. These drugs are by no means considered as possessing the same powers, but act in a manner that enables them to be classed under the above general character. In the discussion of the therapeutic powers of these articles, Dr. Tully reminds us of the manner of some chemical theorists who, in erecting a theory, have no other way to connect the different parts than but by assuming that certain blanks should contain substances not yet discovered. Indeed, the ground-work of the therapeutic structure Dr. Tully is now laying is so extensive, that a sparsity of material is quite unavoidable, inasmuch as his mode of viewing the operation of medicines is very different from that found in ordinary works. Hence, in very many instances, conjecture has to take the place of observation, in order to carry on the work and put substances in the position or classes that they most probably belong in, but which only some isolated observation or botanical affinity as yet gives assurance of.

The next class, "Euphrœnica," is one of the most important of the *materia medica*, and extends through the entire 16th number into the 17th. The definition of this class given by Dr. Tully is six-fold, relating to as many distinct grades of power in articles classed as Euphrenics. It is as follows:—"The Euphrenics, in the first grade of their operation, obviate languor and lassitude when it exists; in the second grade of their operation, they produce a peculiar calm, placid and pleasant sensation, state or condition; in the third grade of their operation they produce a peculiar, rather agreeable, and apparently non-exhausting preternatural wakefulness; in the fourth grade of their operation they produce a greater or less degree of positive exhilaration, which, by some articles, may be increased to such a degree that the actions of the subject are not under control of his will, and, perhaps, it amounts to actual delirium; in the fifth degree of their operation

they occasion a peculiar suspension of the functions of the hemispheres of the cerebrum, and an anæsthesia or destitution of common sensation, or a state of insensibility to pain, sometimes with a complete loss of consciousness, and occasionally with a moderate degree of it. The sixth or last grade of the operation of this class of agents, i. e. the manner in which they destroy life, is unknown to me."

Our readers will at once perceive, that numerous and important remedies are included in this class, such as opium, indian hemp, coffee, tea, chocolate, cocoa, tobacco, chloroform, ether, alcohol, &c., &c. We would be glad to present some of Dr. Tully's views in this connection, but want of space will prevent.

The 17th number concludes in considering the Tonics.

The Art of Perfumery, and Method of obtaining the Odors of Plants, with instructions for the manufacture of perfumes for the handkerchief, scented powders, odorous vinegars, dentifrices, pomatums, cosmetiques, perfumed soap, etc., with an appendix on the colors of flowers, artificial fruit essences, &c., &c. By G. W. SEPTIMUS PIESSE. Philadelphia: Lindsay & Blakiston, 1856, pp. 304. Illustrated with cuts.

The contents of this elegant little volume appeared originally in a series of papers in the "Annals of Pharmacy and Practical Chemistry," a monthly periodical, published at London several years since, but now defunct. During the past two years, these papers have all been re-published in this Journal, except the introductory chapters, and our readers are familiar with their value and scope. Recently these papers have been collected and published in London in a neat volume, with some additions, in the form of an appendix, amounting to about fifty pages, consisting of short papers, more or less allied to the subject of the work, which have been gathered from the "Annals" and other sources. The volume before us is a re-publication of this book. As a treatise on perfumery, M. Piesse's work merits the attention of all those interested in the manufacture of essences, odorous waters, soaps, sachets, powders, and other items of which it treats, and particularly to the druggist and pharmacist. It is very neatly "gotten up" by the publishers, Messrs. Lindsay & Blakiston, and deserves a corner in the pharmacist's library.

The Practitioner's Pharmacopœia, and Universal Formulary, containing 2000 classified Prescriptions, selected from the practice of the most eminent British and foreign medical authorities, with an abstract of the three British Pharmacopœias, and much other useful information for the practitioner and student. By JOHN FOOTE, M. R. C. S., London. With corrections and additions by an American Physician. New York: S. S. & W. Wood, 1855. Pp. 390, 12mo.

We have here another re-publication from a class of works that of late years

have come to us from England, apparently more with a view to make money than for a real need of such helps, which already abound. In France formularies are quite numerous, and Majendie's, long since translated, is well known to the English reader. Of our own country, we have Ellis's and Griffith's Universal Formulary, which are excellent works of their kind, generally well known to American physicians, and the latter is very comprehensive. Then, of the class under consideration, we have "The Prescriber's Pharmacopœia," "Beasley's Prescription Book," and others that we have not seen. All of these last works, in common with that now before us, have their merits, and prove more or less useful to the practitioner, but they embody so many receipts based on preparations not kept in the United States, that they tend to complicate the subject, and sometimes to mislead the physician in reference to preparations he is using; not to speak of the confusion of nomenclature which necessarily arises.

Preliminary to the Formulary is (1) an account of the *treatment* to be pursued in *accidents*, as wounds of different kinds, burns, sprains, fractures, dislocations, foreign substances in the eye, ear or throat, fainting, sun-stroke, convulsions, etc. (2) Of *Poisons* and treatment. (3) An abstract of the three British and the U. S. Pharmacopœias. (4) An abstract of Majendie's Formulary. (5) Artificial mineral waters, and (6) rules for prescribing.

We have not had time to examine the accuracy of the quantity marks which are used throughout the book, nor the character of the formulæ in a pharmaceutical point of view, further than to observe, that no directions are given to the dispenser—the *modus præparandi* being left, as in ordinary prescriptions, to his judgment.

On the Causes and Curative Treatment of Sterility, with a preliminary statement of the Physiology of Generation. By AUGUSTUS K. GARDNER, A. M., M. D., Fellow of the N. York Academy of Medicine, &c., &c. New York: Dewitt & Davenport, 1856. Pp. 170. Octavo. Illustrated.

Vierteljahresschrift für praktische Pharmacie, von Dr. WITTSTEIN, V. Band. 1 and 2 heft, 1856, in exchange for the American Journal of Pharmacy has been received.